Socio-Economic Analysis in support of the Haida Gwaii Timber Supply Review

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1 Executive Summary

1.1 Introduction

Under the authority of Section 3(3) of the *Haida Gwaii Reconciliation Act*, the Haida Gwaii Management Council (HGMC) initiated a Timber Supply Review (TSR) for the Haida Gwaii Management Area (HGMA). The HGMA is defined in Section 1(1) of the *Haida Gwaii Reconciliation Act* as all of Haida Gwaii except for private lands, Indian Reserves (IRs) and municipalities.

The purpose of this socio-economic analysis report within the timber supply review process is to:

- assemble and present recent historical information and data on the Haida Gwaii forest sector, including its position within the overall Haida Gwaii economy; and
- analyze the effects of certain key timber supply related matters on Haida Gwaii current and future social and economic conditions.

This socio-economic analysis is divided into two parts. The first part is a situation analysis that looks at the recent socio-economic experience of the Haida Gwaii forest sector and as such the time period of the past decade 2008-2017 is primarily referenced in this section. The second part of the report examines several key issues that have influenced the socio-economic performance of the Haida Gwaii forest sector and are likely to be important issues going forward as well.

1.2 Situation Analysis

HAIDA GWAII POPULATION

Declining population, -12.8% over the 2006-2016 period

Based on Census of Canada data, the 2016 population of Haida Gwaii was 4,198, a 12.8% decrease over the 2006 population of 4,812, and a 28.0% decrease over the 1996 population. By comparison, the overall population of BC rose by 12.2% over the 2006-2016 period.

The five main communities by population in 2016 are Queen Charlotte (852), Skidegate (Higaagilda) (837), Masset (793), Old Massett (Gaw) (555), and Port Clements (282); these communities account for about 80% of the overall population on Haida Gwaii. The remaining 20% of the population inhabits other areas of Haida Gwaii including the unincorporated communities of Tlell, rural Graham Island, and Sandspit. Skidegate was the only Haida Gwaii community or area that registered a population gain for the 2006-2016 period. The main reason for the Haida Gwaii population decline is that out-migration from

the islands has greatly exceeded its in-migration. For the 2006-2016 period, Haida Gwaii had a small natural population increase (i.e. births exceeding deaths).

Almost half of the Haida Gwaii population identifies as Aboriginal/Indigenous

In 2016, an estimated 47.5% of the Haida Gwaii population identified as an Aboriginal/Indigenous person. The Aboriginal/Indigenous population of Haida Gwaii was an estimated 1,915 in 2016, a 1.6 % increase over the 2006 Indigenous population of 1,885. Although demonstrating a positive trend, the Haida Gwaii Indigenous population increase of 1.6% trailed, by a large margin, the 38% increase in the overall BC Aboriginal/Indigenous population during the 2006-2016 period.

HAIDA GWAII LABOUR FORCE

Shrinking labour supply

The islands resident labour force decreased from an estimated 2,830 workers to 2,290 workers over the 2006-2016 period, a decline of 19.1%.[1]

Aging population and labour supply

The median age of the Haida Gwaii population increased from 39.7 years to 45.1 years over the 2006-2016 period, By comparison, the estimated 2006 median age on the islands was similar to that of the province (40.8 years) whereas by 2016, the estimated Haida Gwaii median age (45.0) was higher than the BC median of 43.0 years.

People aged 25 to 54 years old are considered of core working-age because of their strong attachment to the labour market. The estimated number and percentage share of persons residing on Haida Gwaii in the prime working age group of 25 to 54 years declined from 2,217 (45.7%) in 2006 to 1,669 (39.0%) in 2016.

The resident labour forces of each of Haida Gwaii's main economic sectors, forestry, tourism and public services, have contracted

Haida Gwaii's economy is narrowly focused on forestry (mainly logging), tourism (mainly sport fishing, Haida culture and Haida Gwaii ecological experiences) and public services, including elementary and high school education, health care and government administration. The resident labour force in 2016 totalled 2,290 workers, a 19.1% decline from the 2006 total of 2,830. Worker numbers in the tourism and forestry sectors declined over the 2006-2016 period, 9.4% and 10.8%, respectively, but by a lesser amount than in the public services sector and in the overall local economy. Table ES-1 presents Haida Gwaii's labour force numbers and percentage shares by major sector for 2016 and 2006.[2]

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[1] This labour force data is from the Census of Canada and based on "place of residence", i.e. these workers constitute the labour force members who had their usual place of residence (i.e. permanent residence) on Haida Gwaii at the times of Census enumeration.

[2] This labour force data are from the Census of Canada and is based on "place of residence", i.e. the workers who constitute the labour force members who had their usual place of residence (i.e. permanent residence) on Haida Gwaii.

Table ES-1: Haida Gwaii Labour Force, 2016 and 2006[3]

Sector	2016 #	2016 %[4]	2006 #	2006 %	% change 2016 vs 2006
Tourism	387	16.9	427	15.1	-9.4%
Forestry	290	12.7	325	11.5	-10.8%
Public Services	640	27.9	795	28.1	-19.5%
Other Sectors	973	42.5	1,283	45.3	-24.2%
Total	2,290	100	2,830	100	-19.1%

Source: Statistics Canada 2007 and 2017; unpublished runs of Statistics Canada 2006 and 2016 labour force data supplied to BC Stats; and author's calculations

Data challenges in estimating Haida Gwaii economic activity

The preceding table focused on the resident labour force. Both the forestry and tourism sectors on Haida Gwaii have historically utilized non-resident workers who either reside seasonally or long distance commute for periods or one or more weeks to Haida Gwaii. Generally, less data and information are available on this group of workers but a survey conducted for this timber supply review indicates that the on islands resident share of Haida Gwaii forestry employment has risen in recent years. This shift appears to be largely due to the efforts of Haida Gwaii headquartered Taan Forest Products Ltd. (Taan) to utilize Haida Gwaii resident workers and contractors. Fishing resort lodges (an estimated 16 in 2018) have collectively been an important factor in the Haida Gwaii tourism sector since the 1990s but they have relied as a group on a significant number of off islands seasonal and full-time workers. A new study (expected to report in 2019) may show a greater reliance on local workers at these lodges, in part due to Haida Gwaii-headquartered Haida Enterprise Corporation's (HaiCo's) entrance into the fishing lodge sector and its efforts to hire Haida Gwaii resident workers for its lodges.[5]

FACTORS DRIVING HAIDA GWAII TIMBER HARVESTING

The basic economic activity that underpins the overall performance of the Haida Gwaii forestry sector, whether considered on an annual or a decade basis, is local timber harvesting

[3] The labour force question relates to the individual's job held during the week of Sunday, May 1 to Saturday, May 7, 2016. However, if the person did not work during that week but had worked at some time since January 1, 2015, the information relates to the job held longest during that period. Employment at Haida Gwaii resorts is higher in the summer months than in May but the framing of the question captures workers who may not be working in May but who will likely be working in a month or so.

[4] The percentage share shown in this table is the percentage or share of the total labour force. In the 2009 BC Stats reports, the percentage or share of only the "basic sector" is shown, i.e. forestry's percentage/share of the basic sector.

[5] The Marine Plan Partnership for the North Pacific Coast (MaPP) has a research project underway that is expected to include a survey of Haida Gwaii fishing lodge operators, which will provide an up-to-date estimate of total employment and its characteristics in this key part of the Haida Gwaii tourism sector.

Three factors have had the greatest influence on the timber harvesting performance of the Haida Gwaii forestry sector, two factors on the timber supply side and one factor on the timber demand side.

Demand for wood products in external markets drives Haida Gwaii forest sector economic activities

External market demand for softwoods products (including logs) that matches with the Haida Gwaii log supply profile is a critical factor pushing forward Haida Gwaii forest sector economic activities. Demand conditions in two markets drive the overall commercial harvest on Haida Gwaii Management Area (HGMA) lands. The key longstanding market factor is US housing market demand for cedar wood products and the newer market factor is the demand in China for whitewood logs for input into the manufacture in China of lower value structural wood products, such as cement form materials.

On the supply side, a primary influence on timber harvesting levels has been the regulated Annual Allowable Cuts (AACs) for the Haida Gwaii Management Area (HGMA) and the Haida Gwaii Timber Supply Area (TSA) and Timber Forest Licences (TFLs), which have set the upper limits on the potential total timber harvest in these Haida Gwaii timber harvesting management units. The other very important supply side factor has been the commercially operable volume of Old Growth western redcedar on HGMA lands and on private lands. This factor is directly tied to the cost of timber harvesting and transport on Haida Gwaii.

The intersection of the regulated Haida Gwaii timber supply AACs and the commercially operable western redcedar volumes with the demand for Haida Gwaii timber has driven Haida Gwaii timber harvesting volumes, which has fed through to effects on Haida Gwaii forest sector employment and employment income, log prices, sales revenues and stumpage and goods and services purchasing activity. Shifts in one or more of the three cited key supply and demand factors soon result in distinct economic effects in the Haida Gwaii forest sector and the overall Haida Gwaii economy.

Rising Vancouver Log Market prices reflect strong lumber market demand conditions in the US house building and home renovation markets

Log prices reflect demand conditions for the wood-based end use products that incorporate the logs extracted from coastal BC forests. The annual average price of western redcedar (Old Growth) logs on the Vancouver Log Market (VLM)[6], taking into consideration all log grades, climbed from a low of $101 in 2009 to $233 in 2017, a more than doubling of the

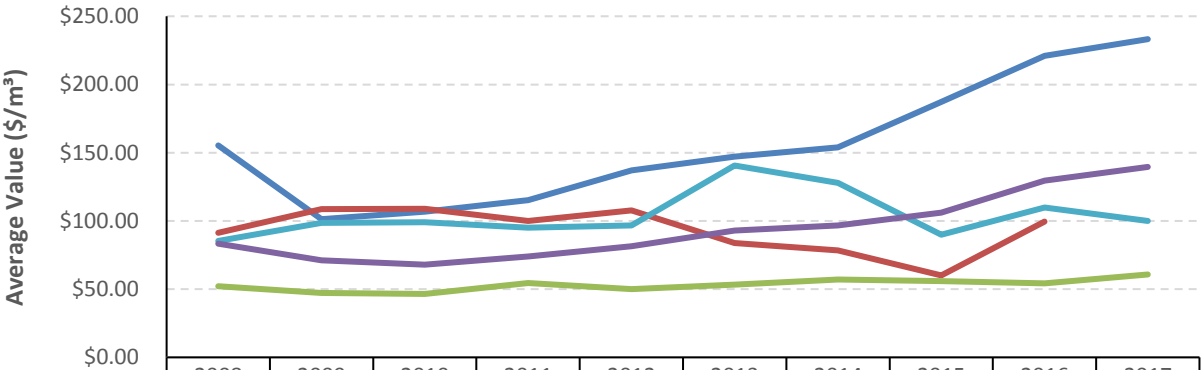
[6] In BC, the functioning log marketplace is organized on a coast-wide basis. Implementation of the BC Government's Forest Revitalization Plan starting in 2003 reinforced this coast-wide marketplace, which facilitates price and quality competition for Haida Gwaii timber along with the timber of other coastal TSAs, TFLs and private lands. Transactions of logs between non-related, Coastal BC-based forest industry parties, such as between a market logger and a wood processing facility, occur within the Vancouver Log Market (VLM), which is a longstanding but informal institution that does not have a centrally organized administrative structure. The selling, buying and trading of logs between entities occurs throughout coastal BC, including Haida Gwaii, but log prices are typically adjusted as necessary to reflect transport costs to the Howe Sound-Fraser River area.

2009 average price when demand conditions in the US housing market were at a low ebb because of the 2008 financial crisis.

Trends in the US housing market are the main factor that feeds back into the demand for Haida Gwaii cedar timber. In BC, about 75% of the province's cedar lumber exports are directed to the US, 95% of its cedar siding exports go to the US and 95% of cedar shake and shingle exports are US-bound (Gregory, McBeath and Filipescu 2018).

Hemlock log prices were largely stagnant over the 2008-2017 and well below Haida Gwaii per m^3 harvest and transport costs. VLM prices for Sitka spruce logs have been relatively strong (taking into consideration all log grades), peaking at about $140/$m^3$ in 2013. These log price trends largely reflect conditions in key log and wood product markets and demonstrate that commercial viability of timber harvesting on Haida Gwaii is substantively determined by the amount of cedar and/or spruce in stands. Figure ES-1 shows the recent trend in cedar, spruce and hemlock Old Growth log prices on the VLM.

Figure ES-1: Old Growth Log Average Price by Species ($/m³)[7], Vancouver Log Market, 2008-2017



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Cedar	$155.28	$101.29	$106.69	$115.23	$137.00	$147.23	$153.91	$187.26	$220.98	$233.21
Cypress	$91.33	$108.65	$108.89	$99.91	$107.64	$83.83	$78.44	$60.07	$99.60	
Hemlock	$52.24	$47.21	$46.49	$54.48	$50.00	$53.38	$57.10	$55.94	$54.28	$60.75
Spruce	$85.35	$98.48	$99.02	$95.02	$96.66	$140.62	$127.95	$89.82	$109.89	$99.94
All	$83.34	$71.19	$67.94	$74.00	$81.50	$92.99	$96.76	$106.01	$129.54	$139.58

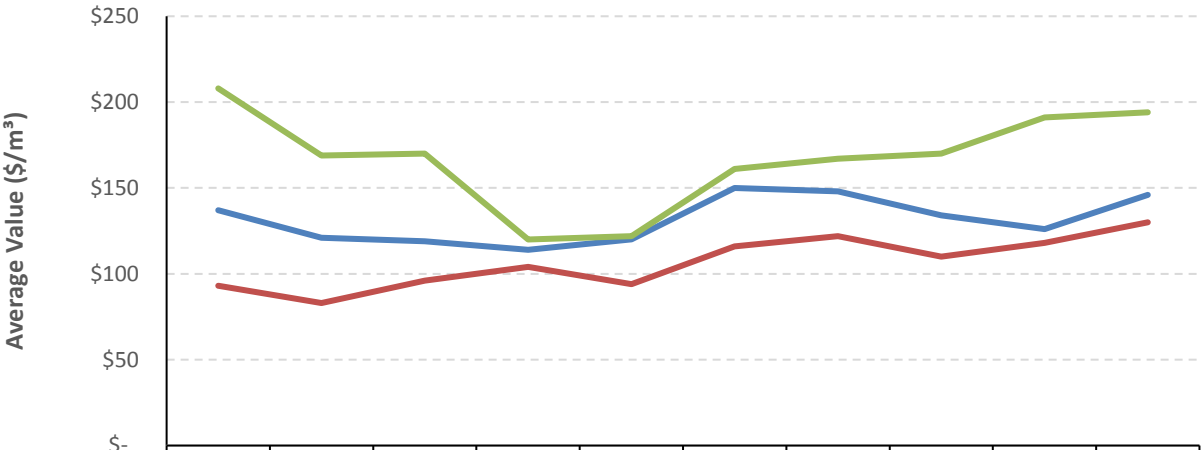
Source: Timber Pricing Branch BC MFLNR 2018 and author's calculations

Export log prices, driven by wood product demand conditions in China (hemlock), Japan (spruce) and the US (western redcedar), have generally exceeded VLM log prices

Figure ES-2 shows the recent trend in and levels of average annual prices of BC export logs by species that are sourced from Haida Gwaii.

[7] All dollar amounts in this report are reported in current Canadian dollars unless otherwise noted.

Figure ES-2: BC Export Log Average Price by Species ($/m³), 2008-2017



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Spruce	$137	$121	$119	$114	$120	$150	$148	$134	$126	$146
Hemlock	$93	$83	$96	$104	$94	$116	$122	$110	$118	$130
Cedar	$208	$169	$170	$120	$122	$161	$167	$170	$191	$194

Source: BC Stats and author's calculations

The higher prices in export markets for hemlock and spruce logs than the prices for these species in the Vancouver Log Market have been a key factor in the diversion of an increasing portion of the Haida Gwaii log harvest from domestic markets over to buyers in China, Japan and South Korea.

HAIDA GWAII AACS AND APPORTIONMENT

From an economic perspective, the HGMC determined AAC sets a maximum allowed annual timber harvesting level for HGMA lands

Table ES-3 shows recent AACs for Haida Gwaii management units TSA 25, TFL 58, and TFL 60. The sum of the Haida Gwaii management unit AACs determined in 2012 was 931,000 m³, a decline of 47.5% from the previous total AAC of 1,772,616 m³. The four woodlot licences contribute an additional 9,293 m³ of AAC.

Table ES-3: Recent AACs for Haida Gwaii Management Units (m³)

Management Unit	AAC determined in 2012 (m³)	Prior AAC (m³)	% change in AAC
TSA 25	512,000	869,748	-41.1%
TFL 58	79,000	100,000	-21.0%
TFL 60	340,000	802,868	-57.7%
All Units	931,000	1,772,616	-47.5%

Source: Sutherland 2012

Haida Gwaii based ownership of Haida Gwaii tenures has greatly increased in recent years

Haida Gwaii-headquartered Taan Forest Products Ltd. is the holder of the TFL 60 tenure, which has an AAC of 340,000 m^3 and is predominantly located on Graham Island with smaller portions located on Moresby Island and on Louise Island. Taan completed the acquisition of the TFL 60 tenure (then called TFL 39 Block 6) from Western Forest Products (WFP) in June 2012 (Taan Forest 2016). Taan also holds a non-replaceable forest licence-First Nations (an area based forest licence to cut), which was obtained in 2010, and accounts for TSA 25's second largest volume apportionment with an AAC commitment of 120,000 m^3.[8] In addition, Taan manages. jointly with BCTS. a volume of 14,210 m^3.[9] These Taan controlled volumes account for approximately 50% of the sum of the Haida Gwaii management unit AACs, a total of 474,210 m^3.

Table ES-4 presents the current AAC apportionment and commitments for TSA 25.

Table ES-4: TSA 25 AAC Apportionment and Commitments (m^3 & % of TSA 25 AAC)

Form of Agreement	m^3	% of AAC
Replaceable Forest Licences	213,632	41.7
Husby Forest Products Ltd. (A16869)	192,044	37.5
A&A Trading (Haida Gwaii) Ltd. (A16870)	13,632	2.7
Dawson Harbour Logging Ltd. (A75084)	7,956	1.6
Non-Replaceable Forest Licences	14,210	2.8
BCTS Partnership (Taan Forest Products)	14,210	2.8
Non-Replaceable Forest Licence – First Nations	120,000	23.4
Haida Tenure (Taan Forest Products)	120,000	23.4
BCTS Timber Sale Licence/ Licence to Cut	81,658	15.9
Community Forest Agreement	80,000	15.6
Forest Service Reserve	2,500	0.5
Total Allowable Annual Cut	512,000	100.0

Source: BC MFLNR 2018b

[8] This tenure is administered as a forest licence to cut (FLTC). Discussions have been underway between the BC Government and Haida Nation associated parties for the conversion of the Taan held FLTC and TFL 60 into an area-based First Nations Woodland Licence, and the arrangements to establish this new licence are expected to be soon finalized.

[9] Joint planning on harvest planning roadbuilding and auctioning.

HGMA TIMBER HARVEST

The average annual harvest of 831,172 m³ over the 5-year 2013-17 period, which coincides with the April 2012 HGMC determination, shows a shortfall of about 10% relative to the HGMA AAC

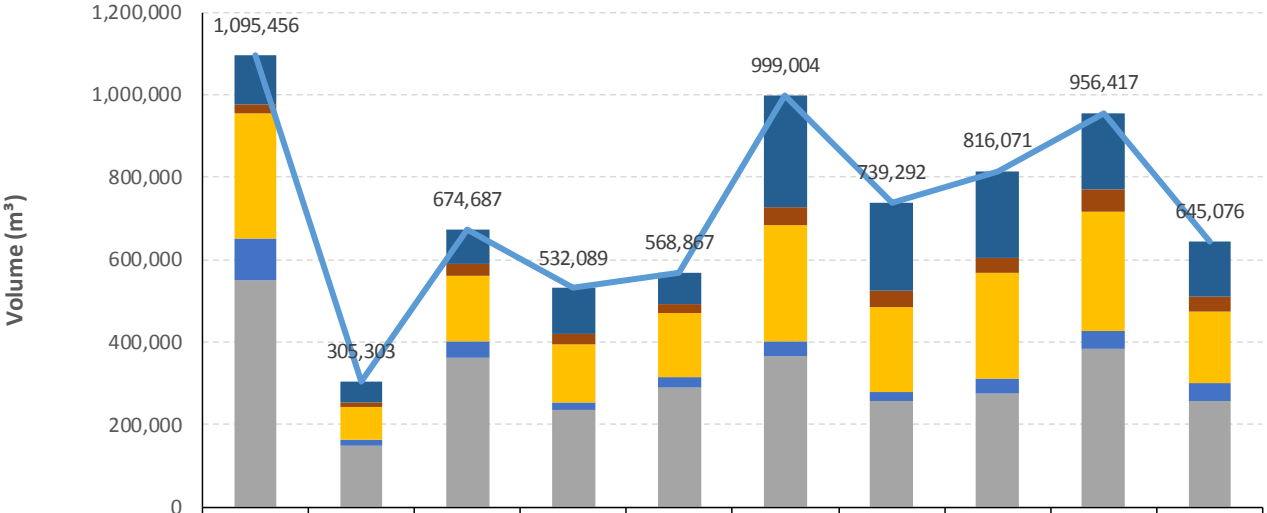
Although the available timber supply for annual harvesting was in the 1.2–1.8 million m^3 range over the 2000–2012 period, the amount of timber harvested by commercial operators and supplied into domestic and international markets fell well short of these levels due to target market demand conditions, cost constraints, and administrative and policy parameters on the Haida Gwaii timber supply side.

The most recent 3-year 2015-17 annual average harvest in the HGMA, 805,854 m^3, exceeded the 10-year 2008-2017 annual average of 733,226 m^3 but was under the 5-year 2013-2017 annual average harvest of 831,172 m^3 because of the harvest volume dip in 2017 to 645,076 m^3.

During the 10-year 2003-2012 period prior to the initial AAC determination of the HGMC, the Haida Gwaii annual timber harvest averaged approximately 780,000 m^3, well below the cumulative total of the then current Haida Gwaii AACs and below the average annual harvest for the 5-year 2013-2017 period.

Over the 2008-2017 decade, the harvest of red and yellow cedar annually averaged approximately 351,000 m^3, accounting for an almost half share (47.8%) of the total HGMA harvest. Over the 5-year 2013-2017 period, the cedar share of the HGMA total harvest was lower (41.4%) compared to the 10-year average share. Historically, stands with substantial percentage shares of Old Growth western redcedar volumes have formed a substantial portion of the commercially operable timber harvesting landbase of Haida Gwaii. This accessible local cedar supply in combination with the strong and large scale demand for cedar logs and cedar wood products in Canadian, US and international markets over the past couple of decades have resulted in attractive prices for cedar logs and wood products and substantial cedar timber harvests on both HGMA lands and Haida Gwaii private lands. Figure ES-3 outlines in a graph and a table the HGMA billed harvest volume by species over the 10-year 2008-17 period.

Figure ES-3: HGMA Timber Harvest Volume by Species (m^3), 2008 - 2017



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Spruce	118,455	51,192	85,031	112,329	75,143	270,736	214,499	212,189	187,211	134,050
Other Species	20,394	9,989	29,083	24,286	23,739	44,403	39,024	36,984	51,329	37,436
Hemlock	304,876	79,393	160,100	142,452	153,689	282,740	207,896	255,562	290,507	171,455
Cypress	101,987	16,471	36,380	17,978	25,343	35,601	18,517	34,197	43,522	44,462
Red Cedar	549,744	148,258	364,093	235,045	290,953	365,525	259,356	277,140	383,848	257,673
Total	1,095,456	305,303	674,687	532,089	568,867	999,004	739,292	816,071	956,417	645,076

Source: Harvest Billing System 2018 and author's calculations

The percentage shares by species of the HGMA harvest for the 2008-2017 period are presented in Table ES-5.

Table ES-5: HGMA Timber Harvest Share by Species (%), 2008 - 2017

Species	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	10-year average
Red Cedar	50.2%	48.6%	54.0%	44.2%	51.1%	36.6%	35.1%	34.0%	40.1%	39.9%	42.7%
Yellow cedar (Cypress)	9.3%	5.4%	5.4%	3.4%	4.5%	3.6%	2.5%	4.2%	4.6%	6.9%	5.1%
Hemlock	27.8%	26.0%	23.7%	26.8%	27.0%	28.3%	28.1%	31.3%	30.4%	26.6%	27.9%
Spruce	10.8%	16.8%	12.6%	21.1%	13.2%	27.1%	29.0%	26.0%	19.6%	20.8%	19.9%
Other	1.9%	3.3%	4.3%	4.6%	4.2%	4.4%	5.3%	4.5%	5.4%	5.8%	4.3%

Source: Harvest Billing System 2018 and author's calculations

LOG EXPORTS

As throughout coastal BC, the log export volume from Haida Gwaii has increased markedly over the past decade

The volume and share of the timber harvest on HGMA lands that was exported climbed from 61,552 m^3 and a 9.1% share of the HGMA lands harvest in 2010 to 267,873 m^3 and a

41.5% share in 2017. Lower value whitewood species accounted for the vast majority of coastal BC export logs because the Government of BC limits the award of export permits for cedar logs to ceremonial or religious uses (incorporation into construction of a religious temple for example). No red or yellow cedar logs harvested on HGMA lands over the 2010-2017 period were given a Government of BC export permit; the HGMA lands harvest that was exported was comprised of whitewood logs.

From the supply side, the main factor influencing Haida Gwaii log exports has been the BC Government order-in-council (OIC) that effectively allows for exporting of Haida Gwaii whitewood logs harvested on BC public lands and BC private lands in any current year equivalent to 35% of the prior year's total harvest volume (excluding waste volumes) from these BC lands. This OIC came into force in 2010 and is part of the longstanding log export regulation systems at the federal and BC government levels.

Another supply side factor was the sale of the private lands portion of TFL 39 Block 6, approximately 10,000 ha, in 2004 by WFP to BC Investment Management Corporation.

FORESTRY RESIDUES

To date, commercially viable market opportunities for Haida Gwaii logging and wood processing residues have proven to be limited but residue utilization initiatives for Haida Gwaii are in the planning stages

Avoidable logging wastes associated with HGMA harvests accounted for about 960,000 m^3 of fibre over the 2008-2017 decade, an annual average of about 96,000 m^3 and 13% of the Haida Gwaii TSA and TFL harvests (HBS 2018 and author's calculations).[10] The Haida Gwaii level of residues is less than the 19% level of avoidable wastes for the overall coastal BC region. Several small Haida Gwaii forestry enterprises have salvage harvest agreements with major tenure holders and/or access small scale salvage licences (for example: Tree Surgeon, Watchman, North Pacific Timber, Maximum Cedar, Against the Grain and Silva).

Plenty of local interest and determination has been shown in recent years to improve Haida Gwaii forestry residues utilization and new efforts have been discussed and a few moved to the planning level.

- A 2012 renewable energy REOFI process for Haida Gwaii was terminated by BC Hydro but HaiCo subsequently submitted biomass fueled generation proposals to BC Hydro
- Taan/HaiCo has conducted business planning for a Haida Gwaii wood processing facility that would incorporate a biomass fueled cogeneration unit
- A fibre recovery tenure on Haida Gwaii was awarded but has not been utilized to date

[10] Avoidable waste volumes are counted as harvest volume against licensee AACs.

- Two small community biomass fueled energy systems on Haida Gwaii currently use externally sourced wood pellets
- A wood fibre briquette making plant at Masset was opened in 2015 but shuttered soon thereafter
- Directing hemlock from Haida Gwaii to southwest BC pulp mills presents cost challenges but pulp log prices are increasing due to sawmill residue constraints in the BC Interior
- Saltwater constraints are generally present for use of coastal log residues in the manufacture of pellets

FOREST SECTOR EMPLOYMENT TRENDS

Both timber harvesting and wood processing employment of Haida Gwaii residents declined since the early 2000s

Estimated Haida Gwaii timber harvesting employment, based on surveys of Haida Gwaii industry participants, shows a decline in the 2015-17 period over the 2002-04 period due to a lower average harvest, greater log export volume and higher logging productivity in the more recent period. Haida Gwaii residents had a higher share of Haida Gwaii direct harvesting employment however in the more recent 2015-17 period, an estimated 81% vs 60% in 2002-04. Table ES-6 compares average annual Haida Gwaii harvests, harvesting employment co-efficients, and harvesting employment for these two time periods.

Table ES-6: Haida Gwaii Timber Harvesting Employment Metrics, 2015-2017 and 2002-2004

Metric	2015-2017	2002-2004
Average annual harvest (m^3)	805,854	1,037,193
Haida Gwaii employment co-efficient (PYs/'000 m^3 of harvested timber)	0.335	0.337
BC employment co-efficient (PYs/'000 m^3 of harvested timber)	0.414	0.557
Haida Gwaii employment (PYs) [11]	270	349
BC employment (PYs)	392	578

Source: survey of HGMA tenure holders, BC MFLNR 2018; Pierce and Lefebvre Consulting 2005; and author's calculations

Timber processing activity and associated employment has historically been relatively low on Haida Gwaii and dropped in recent years

The estimated total amount of Haida Gwaii timber that was processed on the islands was small (5%) in 2002-2004 by comparison to the Haida Gwaii volume processed elsewhere. In the 2015-2017 period, the portion of the Haida Gwaii harvest annually processed on the islands was yet smaller, an estimated 0.6%. The main factor in the further reduction of wood

[11] Employment is stated in person-years (PYs), which is defined as one person working the equivalent of one full year, which is defined as 180 days of work. A person working for 90 days accounts for 0.5 PYs. Full-time equivalents (FTEs) is a term that is used inter-changeably with PYs.

processing activity and associated employment on Haida Gwaii is the combination of adverse operational and financial challenges faced by Haida Gwaii Forest Products (formerly Abfam), which has a small sawmill in Port Clements. This facility was shuttered in 2017 but discussions have taken place between the owners and potential investors about renovating and re-opening this Port Clements mill.

The portion of the Haida Gwaii harvest processed in BC and controlled by Haida Gwaii focused operations did increase significantly, however, due mainly to Taan's establishment of a custom cut program, which was an addition to the well-established custom cut programs of O'Brien & Fuerst and Husby Forest Products Ltd.[12] The custom cut programs of these Haida Gwaii focused harvesting operators accounted for the majority of the Haida Gwaii logs that stayed in BC for processing (and supported associated mill employment in southwest BC).

During the 2015-2017 period, the annual average direct employment on Haida Gwaii based on harvesting and processing HGMA timber was an estimated 285 PYs, and the majority of this direct employment, 270 PYs (95%), was in harvesting activities including log transport

In terms of total employment on Haida Gwaii, which also includes an estimate of the employment supported by forestry firms purchasing goods and services and the employment supported by forest sector connected households locally buying goods and services, the average annual employment impact of the local forest sector on Haida Gwaii was an estimated 414 PYs during the 2015-2017 period.

The employment effects connected to harvesting and processing Haida Gwaii timber more than double when they are considered on a province-wide basis

During the 2015-2017 period, the estimated annual average direct employment in the province based on harvesting and processing HGMA timber was 622 PYs and the total employment effect was an estimated annual average of 1,244 PYs. Although Haida Gwaii resident workers accounted for the largest share of harvesting direct employment (81%), on islands workers held less than half of the total (harvesting and processing) direct employment (43%) because of the small amount of wood processing activity on Haida Gwaii.

HAIDA GWAII TIMBER HARVESTING OPERATING COSTS

Haida Gwaii is a high cost logging location competing in a global market

The higher Haida Gwaii harvesting and transport costs are due to the difficult terrain in certain Haida Gwaii harvesting locations, the cost of barging logs from Haida Gwaii to

[12] Custom cutting programs on coastal BC are based on market logging or log trading operations renting capacity and services at southwest BC sawmills in order to process their harvested logs (mainly cedar logs), to sell the resulting lumber products to wholesalers and retailers in Canada, the U.S. and internationally and to gain a financial return on the sale of wood products manufactured from their harvested logs. Custom cut programs are an alternative to owning and operating wood processing facilities.

Lower Mainland and Vancouver Island timber processing facilities, EBM requirements associated with on islands timber harvesting and use of the FSC certification system (by Taan).

A wide range of logging costs is evident on Haida Gwaii but harvesting of Old Growth timber versus 2nd Growth timber and their associated terrain characteristics is the main point of on islands cost differentiation in recent years and will remain so over the next couple of decades. In the researched examples, helicopter logging is the most expensive ($172/m^3), followed by cable logging of Old Growth timber ($96/m^3). Mechanized falling and yarding of 2nd Growth timber presents as the lowest cost harvesting system on Haida Gwaii ($79/m^3).[13]*

1.3 Key Issues Going Forward

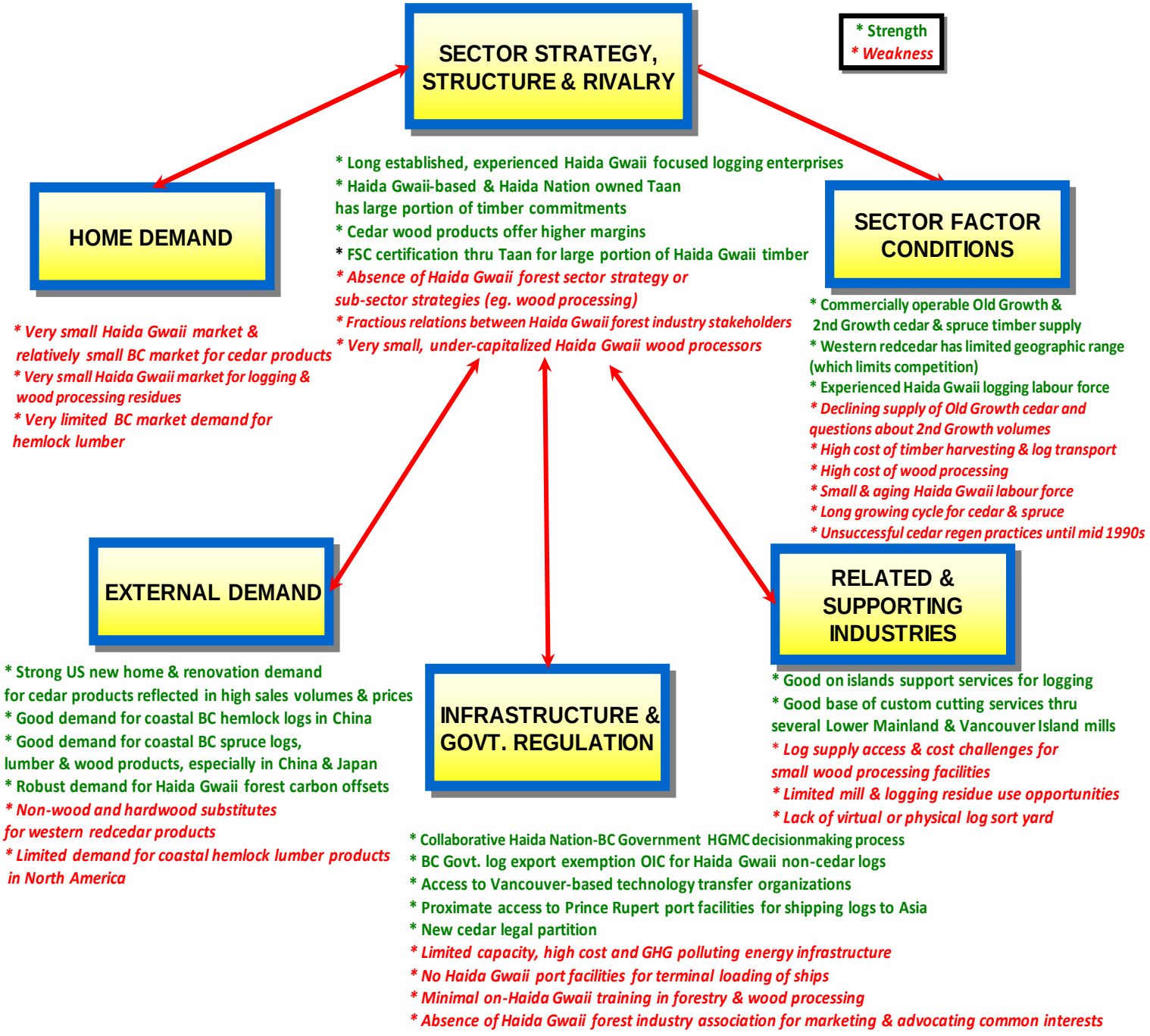
The RFP for this socio-economic report included a Part II in which six questions were framed around issues that look forward at potential effects on the Haida Gwaii forest sector or potential effects of the local forest sector on Haida Gwaii communities and peoples. The six questions were as follows.

- [What is the] Role of cedar as an ongoing economic mainstay (i.e., sustainable supply of economic cedar)?
- What elements of community stability are dependent on timber supply?
- What contribution does wood provide to local versus regional/provincial markets?
- What are the variables and thresholds for second growth forests being economically viable?
- What are the barriers or enablers of fibre flow to local producers? Which barriers have the largest impact on the health of the islands economy?
- What is required (levels of harvest) to provide a security of investment for operators?

Figure ES-1 summarizes the Haida Gwaii forest sector situation analysis and sets much of the context for this review "going forward" issues.

[13] The shown costs are representative estimates and are not average costs based upon a survey of costs of harvesting a sample of Haida Gwaii timber stands. Cost estimates include layout/planning, road construction, felling, skidding/yarding, processing, trucking, and barging, sorting, scaling, and log storage. In general, timber harvesting costs on Haida Gwaii vary by terrain, equipment used, timber types, past development, and geographic location (which affects travel time, difficulty of access, and camp requirements).

Figure ES-1: Summary of strengths and weaknesses of Haida Gwaii Forest Sector

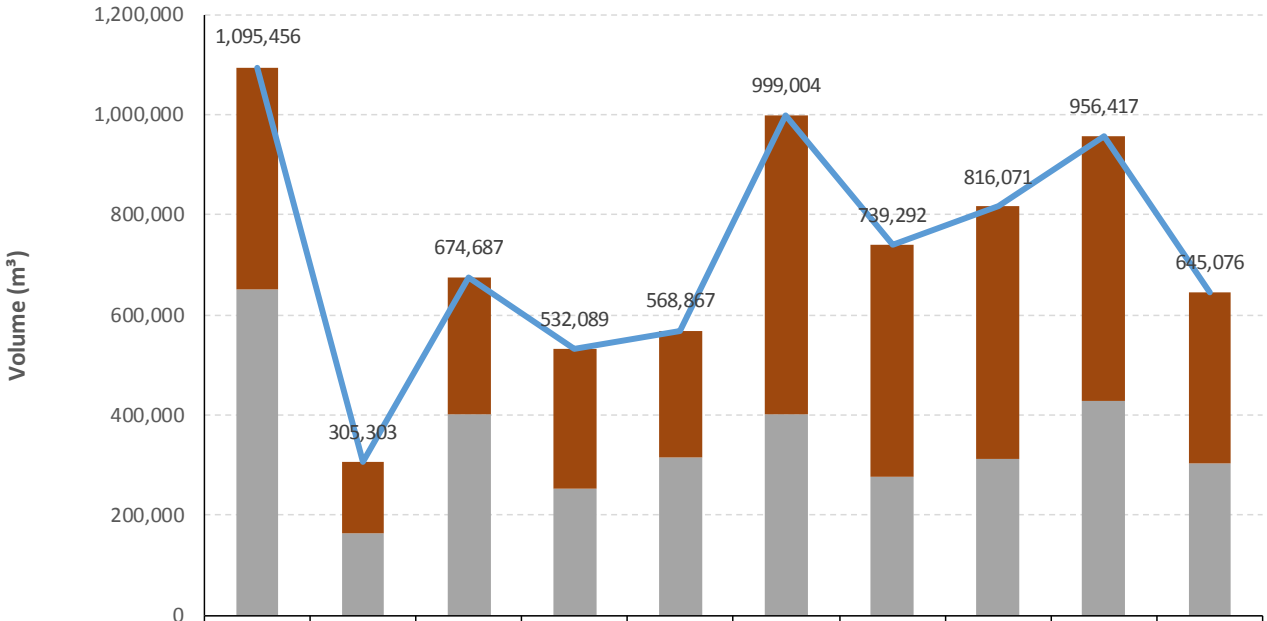


ROLE OF CEDAR

Harvesting cedar has been the "straw that stirs the drink" for the Haida Gwaii forest sector since the mid-1990s. The limited global supplies of western redcedar and yellow cedar are manufactured into specialty or niche products sought by buyers who appreciate cedar's structural, visual and durability qualities. Cedar timber's manufacture into consumer-oriented products is a key distinguishing feature from other coastal BC softwood species that are primarily used for internal (not visible) structural purposes. A question in the RFP for this socio-economic project was [What is the] role of cedar as an ongoing economic mainstay (i.e. sustainable supply of economic cedar)?

The annual average cedar harvest on HGMA lands over the 10-year 2008-2017 period was approximately 351,000 m^3, approximately 48% of the annual average total harvest. Cedar's share of the HGMA harvest ranged from approximately 38% to 60% over this decade. The annual average for the 5-year 2013-2017 period was slightly lower, about 344,000 m^3. Figure ES-4 summarizes the harvest of cedar versus the harvest of other species on Haida Gwaii over the 2008-2017 decade.

Figure ES-4: HGMA cedar harvest versus harvest of other species (m^3), 2008-2017



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Other Species	443,725	140,574	274,215	279,066	252,571	597,878	461,419	504,735	529,047	342,941
Cedar	651,731	164,729	400,472	253,023	316,296	401,125	277,873	311,336	427,370	302,135
Total	1,095,456	305,303	674,687	532,089	568,867	999,004	739,292	816,071	956,417	645,076

Source: Harvest Billing System 2018 and author's calculations

In a weak or limited whitewoods export log situation, cedar largely carries the commercial operability of logging in TSA 25 and TFL 60. A substantive decrease in the prices for cedar

logs and/or the available supply for commercial harvesting would deeply challenge the financial viability of timber harvesting on Haida Gwaii due to the the relatively high cost of harvesting on and transport from Haida Gwaii.

The Technical Working Group for the current timber supply review has put forward an analysis base case timber supply projection that incorporates applicable forest management rules for the HGMA, including the Haida Gwaii LUOO, and a non-declining timber supply flow over a 400 year projection period. The analysis base case annual timber supply for the HGMA is 842,781 m^3 until the 10th decade whereupon the annual timber supply is projected to increase to 926,000 m^3 and remains at that level in subsequent decades.

This HGMA base case projection incorporated a declining flow timber supply projection for cedar, the target starting point of which was the maximum cedar harvest level from the previous chief forester AAC determinations. The annual timber supply volume of cedar in the base case starts (in the 1st decade) at 277,000 m^3, steeply declines to an annual volume of 122,000 m^3 by the 4th decade and then increases and stabilizes to approximately 176,000 m^3 by the 8th decade.[14]

The base case annual cedar volume projection starts slightly lower than the average annual cedar harvest (for the 2008-2017 period) of approximately 351,000 m^3 and lower than the sum of the maximum cedar harvest levels expressed by the chief forester of 360,000 m^3. Within 30 years, the base case annual cedar volume projection shows a cedar harvest level of about 147,000 m^3, which would be almost the same harvest as that experienced in only one year, 2009, in the past 10. This level would likely be in place for about 10 years, and then drop further yet.

These projections (notably the projected steep declines in cedar volumes and increasing share of hemlock in the HGMA timber supply in the next few decades) and the anticipated increase in market values per m^3 due to the shrinking supply of Old Growth Coastal BC timber indicate that policy and administrative approaches for the management of cedar timber supply over time will be an important consideration for the HGMC and the Chief Forester in HGMA related AAC determinations now and well into the future. At a high level, the current and near term timber stock and supply situation of TFL 58 provides a glimpse into the timber stock and supply situation in 30 years of the other Haida Gwaii management units. Relative to TSA 25 and TFL 60, TFL 58 currently has a lower share of cedar and a higher share of managed stands in its timber stock and supply.

[14] If a long run average yield (LRAY) approach was taken to projecting cedar timber supply in the HGMA base case then the cedar volume projection would be an average 146,371 m^3 (Technical Working Group 2019). (Technical Working Group 2019).

COMMUNITY STABILITY AND TIMBER SUPPLY

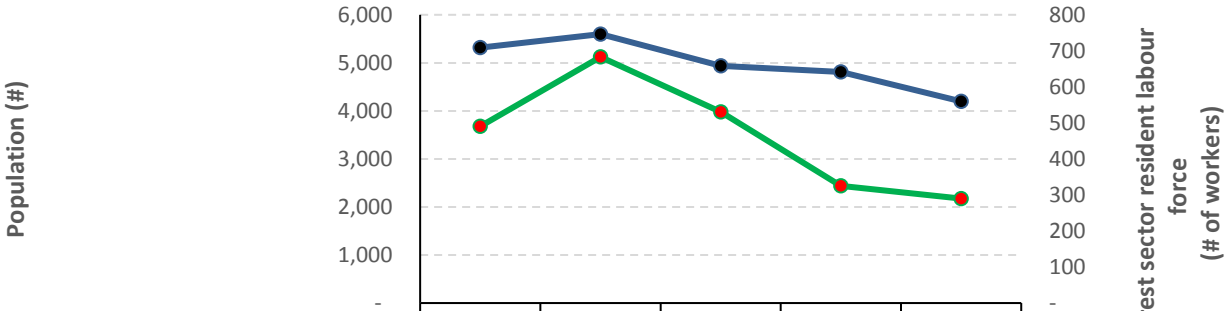
A question in the RFP for this socio-economic project was "What elements of community stability are dependent on timber supply?"

The forest sector employees residing on the islands create both a demand for public services in health, municipal infrastructure, schools and recreation but also contribute to a residential tax base and a critical mass or base of residents who can support the public services of small organized communities. These forest worker households also contribute to creating a customer and client base sufficient to support a small but reasonably broad range of retail and professional services, food and beverage businesses and even public services, such as public schools, spread across the Haida Gwaii communities.

Forest sector related employment is the main pathway through which the forest sector has direct effects on community stability on Haida Gwaii. As forest sector employment contracts some affected individuals and families permanently leave Haida Gwaii to seek or accept new employment resulting in local population decline and shrinkage in the residential tax base and fewer residents to support on islands community activities and to patronize local retailers and public services, such as schools.

Figure ES-5 shows the direct correlation between Haida Gwaii's population levels and the number of local workers employed in the Haida Gwaii forest sector. Both Haida Gwaii's population and the Haida Gwaii forest sector have declined for the shown years since 1996. The decrease in population has not been as sharp in percentage terms as for the forest sector labour force because a portion of the terminated forest sector workers either retire or switch to work in another sector on Haida Gwaii rather than move elsewhere.

Figure ES-5: Trend Comparison of Haida Population and Forest Sector Resident Labour Force by Census Year



	1991	1996	2001	2006	2016
Population (by Census Year)	5,316	5,598	4,935	4,812	4,198
Forest sector resident labour force	490	683	530	325	290

Source: Census of Canada

CONTRIBUTIONS OF HAIDA GWAII WOOD TO HAIDA GWAII, BC AND INTERNATIONAL MARKETS

From a wood products market perspective, the Haida Gwaii situation is consistent and in accord, in a broad sense, with other areas of BC in that the vast majority of Haida Gwaii timber fibre is ultimately sold into international markets. The local Haida Gwaii demand for wood products, especially cedar products, is vibrant in that wood is the focus of local structural and exterior building materials, but the local marketplace is nevertheless very small. In the case of Haida Gwaii, the vast majority of its timber is sold either as cedar lumber products into the US or as whitewood logs into China and a few other Asian countries.

A question in the RFP for this socio-economic project was "What contribution does wood provide to local versus regional/provincial markets?"

A distinct characteristic of the Haida Gwaii situation is that very little Haida Gwaii timber is milled on Haida Gwaii into wood products but a large portion of the processing of Haida Gwaii timber is controlled by Haida Gwaii focused enterprises. Both Husby and O'Brien & Fuerst have long had established custom cutting programs whereby they have maintained control of the processing and marketing of their Haida Gwaii timber through rental of capacity at Lower Mainland mills and log trades. Taan, which now controls the largest share of the HGMA AACs (approximately 50%), has created a custom cutting program using Lower Mainland sawmills over the past few years. The volume and share of the Haida Gwaii timber harvest that is directed through the custom cut programs of Husby, O'Brien & Fuerst and Taan varies on a year to year basis due to several supply and demand factors, including the proportion of cedar in the total harvest, but in broad terms, the HGMA lands harvest share processed in Lower Mainland mills through the custom cut programs of these three enterprises amounts to about 40% in the past few years.

From the supply side, the main factor influencing Haida Gwaii log exports has been the 2010 BC Government order-in-council (OIC) that effectively allows for exporting of Haida Gwaii whitewood logs harvested on BC Crown lands and BC private lands in any current year equivalent to 35% of the prior year's total harvest volume (excluding waste volumes) from these BC lands.

Since the 2010 introduction of the Haida Gwaii exemption order, whitewood log exports from Haida Gwaii to Asian destinations have greatly increased, driven by the considerable gap in whitewood log prices between offshore and Coastal BC markets, and here the Haida Gwaii logs are processed into, mainly, structural lumber products. All current parties holding major Haida Gwaii tenures are whitewood log exporters. In January 2019, the BC Government extended the Haida Gwaii log export OIC but only until July 31, 2019 and communicated that a plan or strategy to address BC log export policy and TSL bidding is forthcoming. An elimination of this Haida Gwaii OIC would not change log demand conditions in Chinese, South Korean and Japanese markets but would negatively alter the commercial viability of harvesting stands on Haida Gwaii with low cedar and/or spruce components. The matter of log exports and Coastal BC log processing is exceedingly complex and its dimensions and characteristics vary along the BC Coast. Definitive conclusions aren't yet possible about

potential effects to the Haida Gwaii forest sector since the contents of the BC Government's log export policy changes are not known at this juncture but the Haida Gwaii case should be looked upon as highly sensitive to alterations in the current OIC given the relatively high cost structure of harvesting and transport of Haida Gwaii timber.

SECOND GROWTH FORESTS ECONOMIC VIABILITY

Second Growth timber on Haida Gwaii presents different challenges for the local forest sector on both cost and revenue sides of the financial ledger. A question in the RFP for the socio-economic project focused on Second Growth forests, "What are the variables and thresholds for second growth forests being economically viable?"

Considerable experience has already developed on Haida Gwaii with both harvesting and marketing Second Growth forests. Within an overall coastal BC context, the BC Government and forest industry organizations, such as FPInnovations, have led research and policy-making on challenges, opportunities and strategies to understand and address the shift from harvesting and processing Old Growth timber to Second Growth timber throughout the BC Coast.[15]

On the cost side, in general, harvesting Second Growth stands presents cost advantages. Based on Haida Gwaii examples, the harvest and transport cost for a Second Growth focused logging system is estimated as approximately $\$79/m^3$, which is about 80% of the estimated $\$96/m^3$ cost for an Old Growth focused harvesting system. Specific stands will vary in their costs based on stand volume, terrain, location proximity to a forest road, etc. but this comparison conveys the relative cost advantage presented by harvesting Haida Gwaii Second Growth stands.

The lower per m^3 harvesting cost would largely be captured at the expense of employment as more mechanized harvesting and less road and bridge development would reduce labour requirements. A transition to more mechanized harvesting also reinforces a movement towards larger development volumes to spread out the new overhead capital costs.

On the other side of the ledger, Second Growth cedar logs capture a lower price in the Vancouver Log Market than Old Growth cedar logs. Using 2015-2017 average log prices for comparison purposes, Second Growth logs captured a price in the Vancouver Log Market that was about 82% of the recent average prices for Old Growth cedar logs.

We focus here on log costs and prices but milling cost, lumber recovery rates and wood products (including types that can be manufactured, product quality and wholesale and retail price) vary by use of Second Growth and Old Growth logs as the fibre input. A thorough understanding of many of these Second Growth cedar lumber product issues is an important matter needing additional research and development. FP Innovations undertook a couple of short research exercises on a few Second Growth cedar lumber product issues and the researchers concluded that additional research is needed, "A comprehensive research task

[15] The "BC Coastal Forest Sector Hem-Fir Initiative" is possibly the most well-known effort, see http://www.bccoastalinitiative.ca/index.html. This program included a "Coastal Cedar Focus".

force approach is recommended to provide definitive answers to questions and contradictions obscuring a clear understanding of the properties and potential of second-growth redcedar. The task force should be similar to those undertaken on the coast for Douglas-fir and western hemlock." (Middelton and Munro 2013).

TIMBER FLOW TO LOCAL PRODUCERS

A longstanding concern on Haida Gwaii, but also a general concern in several other areas of the province, has been the challenges that small- and medium-sized mills face in acquiring timber to process into wood products. For example, a Canadian Forest Service study issued in 2000 observed that "The key hurdle identified by local QCI manufacturers is a lack of consistent fibre supply. This is the message repeated in virtually all of the reports done on the QCI forest sector. Local processors contend that if wood supply problems could be resolved, they could cope with other challenges…" (Wilson and Stennes 2000). Fibre supply access challenges for micro and small mills are still very much a top of mind issue based on the interviews with small scale Haida Gwaii forestry enterprises undertaken for this project. A question that was raised in the RFP for this socio-economic study was as follows, "What are the barriers or enablers of fibre flow to local producers? Which barriers have the largest impact on the health of the islands economy?"

The barriers of fibre flow to local wood processors that were identified in the interviews conducted for this socio-economic project were the following.

- Market-based log pricing asked by licensees.
- Payment conditions for acquiring logs from licensees.
- Absence of secure, long-term fibre access arrangements for small scale processors.
- Lack of BCTS Category 2 program auctions on Haida Gwaii for local enterprises with micro- or small-scale wood processing operations.
- Financial challenges of Haida Gwaii small scale wood processors to successfully compete in BCTS TSL and Category 2 program auctions.
- No Haida Gwaii log sort operation to direct fibre to local processors along the lines of the monumental cedar log sort operated by the Ministry.
- No organized notification of available fibre via a website or other means.

The matter of access and cost of fibre for Haida Gwaii wood processors was also raised in the 2015 [Haida Gwaii] Forestry Strategy Forum and its background discussion paper, which also pointed out a few other matters that also have substantial effects for the competitiveness of small scale wood processing on Haida Gwaii, "The lack of a stable, vibrant manufacturing sector is usually attributed to the lack of long-term availability of a supply of high quality logs, the inability to secure capital and lines of credit, the small local market, the lack of a stable trained work force, energy and waste issues, and the lack of information about, and access to, off-island markets." (Moore Resource Management 2015a).

At a minimum, the log availability issue could be quickly addressed in part by using current (and fairly modest) website capabilities to set up a "virtual log sort yard" for Haida Gwaii. On a longer term basis, consideration ought to be given to developing a Haida Gwaii strategy focused on log supply to local micro mills and small wood processors.

TIMBER HARVEST NEEDS FOR FINANCIAL SUSTAINABILITY

A question was posed in this project's RFP about the level of annual average timber harvest in relation to investment security, "What are required (levels of harvest) to provide a security of investment for [harvest] operators?". This question is often discussed throughout the BC forest industry because of the substantial capital and workforce investments that are required to sustain operations over a time period in which investments can be recouped along with a suitable profit in line with the financial risk assumed by the enterprises.

In terms of the level of annual harvest that would be desirable to financially sustain a market logging enterprise on Haida Gwaii, the responses from Haida Gwaii forest sector participants who were interviewed varied between an annual average of 75,000 m^3 and 100,000 m^3. Location of harvesting, specifically terrain conditions, and stand species and age composition, would be important influencers on the amount of desirable operable volume in the Haida Gwaii context but this 75-100,000 m^3 range is a good basis for consideration of the average annual volume that's needed to sustain a viable market logging enterprise over the long term.

2 Introduction

2.1 Project Purpose

Under the authority of Section 3(3) of the *Haida Gwaii Reconciliation Act*, the Haida Gwaii Management Council (HGMC) has initiated a Timber Supply Review (TSR) for the Haida Gwaii Management Area (HGMA). The HGMA is defined in Section 1(1) of the *Haida Gwaii Reconciliation Act* as all of Haida Gwaii except for private lands, Indian Reserves (IRs) and municipalities. The objectives of this TSR are to:

- examine the impact of current legal requirements and demonstrated forest management practices on the timber supply, economy, environment and social conditions of Haida Gwaii and the province of BC;
- consider that the new update forest inventory and information about cedar harvest
- receive input from Haida citizens, forest licensees, other forest sector participants and the greater public on timber supply related matters;
- support the deliberations of the Haida Nation and BC Government members of the HGMC in their determination of an AAC for the HGMA: and
- identify information to be improved for and possibly incorporated into future timber supply reviews.

The purpose of this report within the timber supply review process is to:

- assemble and present recent historical information and data on the Haida Gwaii forest sector, including its position within the overall Haida Gwaii economy; and
- analyze the effects of certain key timber supply related matters on Haida Gwaii current and future social and economic conditions.

This socio-economic analysis is divided into two parts. The first part looks at the recent socio-economic experience of the Haida Gwaii forest sector and as such the time period of the past 2008-2017 decade is primarily referenced in this section. The second part of the report examines several key issues that have influenced the socio-economic performance of the Haida Gwaii forest sector and are likely to be important issues looking forward as well. These key issues were listed in the request for proposals for this project issued by the Haida Gwaii Management Council and are as follows.

- Role of cedar as an ongoing economic mainstay (i.e., sustainable supply of economic cedar)
- What elements of community stability are dependent on timber supply?

- What contribution does wood provide to local versus regional/provincial markets?
- What are the variables and thresholds for second growth forests being economically viable?
- What are the barriers or enablers of fibre flow to local producers? Which barriers have the largest impact on the health of the islands economy?
- What is required (levels of harvest) to provide a security of investment for operators?

This socio-economic report is the first one undertaken in connection with a timber supply review process in support of a HGMC determination of the Haida Gwaii Management Area AAC. The HGMC determined an initial AAC for the HGMA of 929,000 m^3, which became effective April 4, 2012 (HGMC 2012). A comprehensive socio-economic research report was not prepared as part of the 2011-2012 timber supply review although the HGMC released a public discussion paper that included basic socio-economic profile information and data along with a summary of a technical analysis of the then current timber supply (Haida Gwaii Management Council 2011). As well, a socio-economic report was not prepared as a background document as part of the analysis process in support of the Chief Forester's September 20, 2012 rationale for and determination of AACs for Timber Supply Area 25, Timber Forest Licence 58 and Timber Forest Licence 60.

Neither the *Haida Gwaii Reconciliation Act* nor the *Forest Act* provide factors that the HGMC should take into consideration in determining the HGMA AAC but the HGMC in its April 2012 AAC rationale outlined that "…the procedure used by recent chief foresters of identifying and considering specific individual factors that are relevant in defining timber supply provides a sound basis for determining a reliable AAC" (HGMC 2012). Section 8 of the *Forest Act* requires the Chief Forester to consider several factors[16] in determining AACs for timber supply areas (TSAs) and Tree Farm Licences (TFLs), which includes reference to social and economic conditions. In addition, a July 4, 2006 letter from the Minister of Forests and Range to the Chief Forester outlined the social and economic objectives of the Crown that the Chief Forester should incorporate into decisionmaking about AAC determinations (Sutherland 2012).

The most recent socio-economic analysis in connection with a Haida Gwaii timber supply analysis process was completed in 2006 when the BC Government's Integrated Land Management Bureau commissioned a socio-economic assessment of land use scenarios to help provide an understanding of potential impacts of proposed agreements and alternate viewpoints resulting from the Haida Gwaii/Queen Charlotte Islands Community Planning Forum process and the January 2006 Haida Gwaii/Queen Charlotte Islands Land Use Plan

[16] The rate of timber production that may be sustained in the area under study; the short and long term implications to British Columbia of alternative rates of timber harvesting from the area; the economic and social objectives of the BC Government for the area, for the general region and for BC; and abnormal infestations and devastations (such as major wildfires) of and major salvage programs planned for the area under study.

Recommendations Report (Pierce Lefebvre Consulting 2006). A couple of years earlier, a socio-economic "base case", which described the Haida Gwaii forest sector, was prepared by a BC Government commissioned consultant as a background document in support of the then underway Haida Gwaii/Queen Charlotte Islands Land Use Plan process (Holman 2004).[17]

Information from this 2019 socio-economic report will be used by the HGMC to help inform its deliberations on determining a new AAC for the HGMA and to help inform the Haida Nation, forest licensees, BC Government staff and the general public during and after the public discussion period of the Haida Gwaii timber supply review process on socio-economic matters connected to timber harvesting and processing on Haida Gwaii.

2.2 Study Approach and Methodology

This report draws upon past practices in BC for preparing socio-economic impact assessments of land use planning processes (BC Ministry of Agriculture and Lands 2007; Horne 2007).

In broad terms, the information for this report was developed from two groups of sources; one is secondary source material consisting of print materials and internet sourced documents, and the second is primary research undertaken (1) through an email-based survey of major Haida Gwaii forest sector operators and (2) via phone and in-person interviews with several Haida Gwaii forest sector stakeholders. In addition, several parties with expertise about BC and international forest sector matters were contacted to provide information on Coastal BC log and wood product markets, logging systems, timber harvesting and log transport costs and forest sector regulation.

Reports and studies with information on Haida Gwaii forest sector matters were accessed and reviewed as part of this project's research process, including but not limited to the following.

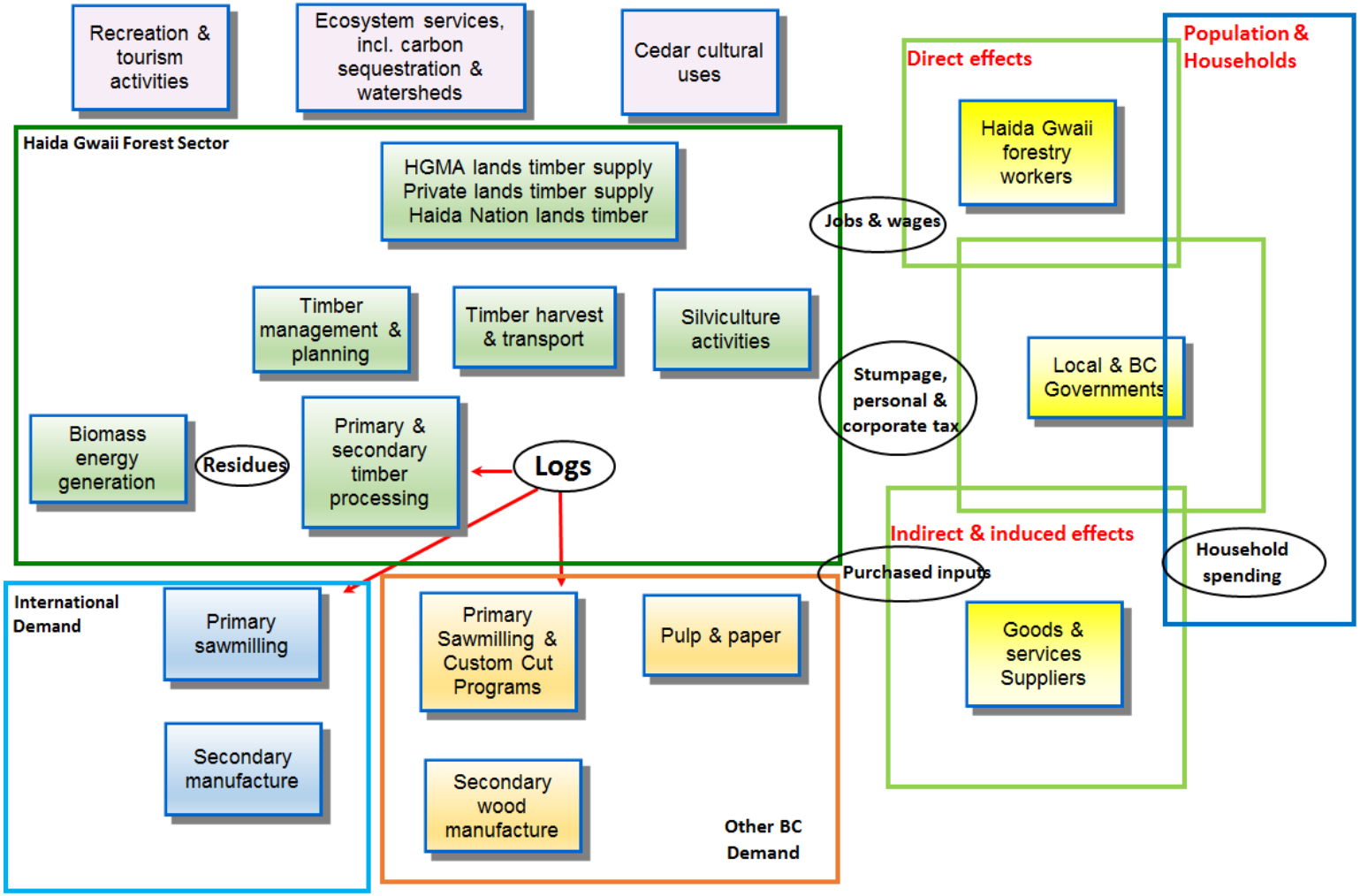
- Cortex Consultants and HiMark Forest Consultants Ltd., Second-Growth Timber Opportunities on Haida Gwaii, June 2004
- Council of the Haida Nation, How forestry works on Haida Gwaii, March 2017
- Ecora Resource Group Ltd., Haida Gwaii TSA Economic Operability Assessment, 2015
- Gowgaia Institute, Forest Economy Trends and Economic Conditions on Haida Gwaii, 2007
- Haida Gwaii Management Council, AAC Rationale for Haida Gwaii, April 2012

[17] A base case is the current status and anticipated trends in population and the economy.

- Haida Gwaii Management Council, Developing a Forest Strategy for Haida Gwaii: A proposed pathway to defining the long term future of sustainable forests, communities and the forest businesses on the Islands, November 2013
- Holman, G., HG/QCI Land Use Plan Socio-Economic Base Case (Final Draft), 2004
- Joint Technical Working Group, Haida Gwaii Timber Supply Review Timber Supply Analysis Report, April 2012
- Lions Gate Consulting Inc. et al, Haida Gwaii/Queen Charlotte Islands Community Viability Strategy, May 2007
- Markey, S., Economic Development on Haida Gwaii: "Ounces, not Pounds", March 2012
- Misty Isles Economic Development Society, Economic Development Plans on Haida Gwaii, April, 2016
- Moore Resource Management, A Summary of the Forestry Strategy Forum, 2015
- Moore Resource Management, The Offer of a Community Forest for MIEDS Information, Evaluation, Options for Decision and Next Steps, 2016
- Pierce Lefebvre Consulting, Socio-Economic Assessment of Haida Gwaii / Queen Charlotte Islands Land Use Viewpoints, March 2006
- Stennes, B. and Wilson. B. The Queen Charlotte Islands – A Discussion of Forest Sector Development, 2000
- Sutherland, J., AAC Rationale for TFL 58, TFL 60 and TSA 25, September 2012

On Haida Gwaii, timber harvesting is the basic economic activity that underpins the overall performance of the Haida Gwaii forest sector. Therefore, changes in the overall Haida Gwaii timber harvest, along with changes in the harvest by species and age category flow through to changes in other key economic variables, including but not limited to employment and employment income, purchases of goods and services at suppliers, and forest company revenues and BC government revenues. Figure 2-1 outlines and summarizes the socio-economic analysis framework used for this project.

Figure 2-1: Socio-economic analysis framework



An estimate of employment and employment income connected to harvesting and processing of Haida Gwaii timber was developed for this report. The estimates of forest industry direct employment are based mainly upon a questionnaire administered to holders of TSA 25 Forest Licences and Timber Sale Licences and holders of TFL 58 and 60 tenures and to a questionnaire administered to operaters of certain Haida Gwaii wood processing operations.

Timber harvesting and processing employment is tied to the volume of harvested timber so is calculated as an employment per 1,000 m^3 of harvested timber co-efficient.[18] This approach allows for a ready estimate of forest sector employment and income impacts based on timber harvest level changes. Responses to these questionnaires provide the basis for calculating direct employment per m^3 associated with Haida Gwaii and BC timber harvesting and processing.

Indirect and induced employment impacts were calculated by applying multipliers to the direct employment figures (Horne 2007). Local area multipliers were calculated by BC Stats, based on the BC input/output model, for all areas of the province except the Lower Mainland (Horne 2009a). Indirect employment occurs in businesses supplying goods and services to forest sector companies, while induced employment occurs in businesses supported by the spending of direct and indirect employment income.

This report examines all forest industry uses of Haida Gwaii timber, including harvesting, processing, sales to domestic and international markets, silviculture activities such as re-planting, harvesting and processing residue use and carbon storage.

2.3 Context

Several Haida Gwaii specific initiatives occurring over the past fifteen years underlie or have substantively influenced important shifts in local timber harvesting and processing activity levels and their associated economic results on Haida Gwaii.[19] The cumulative impact of these

[18] Employment is stated in person-years (PYs), which is defined as one person working the equivalent of one full year, which is defined as 180 days of work. A person working for 90 days accounts for 0.5 PYs. Full-time equivalents (FTEs) is a term that is used inter-changeably with PYs.

[19] Using 15 years as the look backwards at key events affecting the Haida Gwaii forest sector was based on starting with the commencement of the land and resource use planning that ultimately led to several fundamental changes in regulation and management of Haida Gwaii timber resources. These changes include but are not limited to the following: implementation of ecosystem-based management; creation of the Haida Nation-BC Government collaborative decisionmaking through the Haida Gwaii Management Council; the major entry of the Haida Nation into the local forest industry through the creation of Taan Forest Products Ltd. and securing major Haida Gwaii forest tenures; and the 2012 AAC determination for the Haida Gwaii Management Area. Prior to 2003, important events unfolded on Haida Gwaii that had direct effects on the local forest sector, communities and peoples, and these include the Gwaii Haanas Agreement, the 1996 ICSI Consensus document and the 2000 TSR and the local protests in response to aspects of this TSR process.

initiatives has resulted in a transformation of the Haida Gwaii forest sector in terms of forestry regulation and forest sector economic structure and participation. These initiatives were spearheaded either by the Haida Nation, the Government of BC or both in collaboration, and collectively extend beyond a reform of either regulation or timber tenure holdings into a structural transformation, which is still in process. In rough chronological order, these key initiatives or undertakings are the following.

- In September 2003, the Council of the Haida Nation and the Province of BC jointly initiated and led a land and resource use management (LRMP) planning process, incorporating an ecosystem-based management (EBM) framework into plan development. This consensus seeking effort to develop a strategic land use plan ended in February 2005 with agreement on several land and resource use issues and no agreement on several other matters.
- In 2004, the Supreme Court of Canada ruled that the Province of BC has a duty to undertake meaningful consultation with affected First Nations when considering a grant or renewal of a tree farm licence. This ruling was in connection with a case brought forward by the Haida Nation on the lack of consultation in regard to the renewal of TFL 39. This Supreme Court of Canada ruling has become the leading judicial precedent on the Crown's duty to consult with First Nations over decisions where Indigenous interests may be affected.
- In 2004, Western Forest Products completed a process of removing approximately 10,000 ha of private lands in the vicinity of Yakoun Lake on Haida Gwaii from TFL 39 Block 6 and selling these lands to BC Investment Management Corporation (BCIM).[20]
- In 2004, a protocol agreement between the Council of the Haida Nation and the municipalities of Port Clements and Masset was signed. Similar agreements between the Haida Nation and the Village of Queen Charlotte and the Skeena-Queen Charlotte Regional District Electoral Area D Regional District were subsequently signed in 2006. The agreements committed the signing parties to jointly "work together in designing a future that will support a healthy environment and create a sustainable islands economy" and to undertake several specified collaborative initiatives.
- The Haida Nation organized and led the Island Spirit Rising movement in Spring 2005, which culminated in several undertakings, including the BC Government using Part 13 of the *Forest Act* protection orders to help implement the Haida Land Use Vision, commitments to implement a Haida Gwaii land use plan that reflects the Haida Land Use Vision, development of an area based forest tenure that would be

[20] BC Investment Management Corporation is the entity managing BC Government and other BC public sector pension plan assets and was created under the *Public Sector Pensions Plan Act*.

direct awarded to the Haida Nation, expediting of a new Haida Gwaii Timber Supply Review, and an initial payment by the BC Government of $5 million as resource revenue sharing to the Haida Nation.

- In 2007, after government-to-government negotiations, the Haida Nation and the Province of BC signed the Haida Gwaii Strategic Land Use Plan Agreement, which incorporated provisions for co-management of Haida Gwaii lands and resources by the Haida Nation and the Province of BC and for use of ecosystem-based management (EBM) in Haida Gwaii forested land management and timber harvest planning.
- On March 22, 2008, the Province of BC and the Haida Nation signed an "Interim Forest Revenue-Sharing Agreement" that provides for annual interim payments by the Province of BC to the Haida Nation as an accommodation of the potential infringements of the economic component of the Haida Nation's Aboriginal interests arising from or as a result of forest and range development. This agreement was amended in 2014 and 2018 and has a current termination date of March 31, 2019.
- To further this new relationship outlined in the Haida Gwaii Strategic Land Use Plan Agreement, the Kunst'aa Guu – Kunst'aayah Reconciliation Protocol between the Haida Nation and the Province of BC was formalized two years later in December 2009. This protocol establishes that decisions about resource development and land use on Haida Gwaii are to be jointly shared by the Haida Nation and the Province of BC.
- The Haida Gwaii Management Council, consisting of two Haida Nation representatives,two BC Government representatives and a chairperson appointed by both parties, was provided for in the 2009 'Kunst'aa Guu – Kunst'aayah' Reconciliation Protocol and established in Haida law through the KaayGuu Ga ga Kyah ts'as – Gin 'inaas 'laas 'waadluwaan gud tl'a gud giidaa Haida Stewardship Law and established in provincial statute through the *Haida Gwaii Reconciliation Act* in June 2010. The initial Haida Gwaii Management Council was formed in 2011.
- In January 2010, the BC Government deleted Block 6 (Haida Gwaii) from TFL 39, then held by Western Forest Products Ltd. (WFP), and created TFL 60 from the former Block 6 area.
- With the June 2010 royal assent for the *Haida Gwaii Reconciliation Act*, the islands formally referred to as the Queen Charlotte Islands by the BC Government were re-named as Haida Gwaii for Province of BC purposes.
- In 2010, Taan Forest Products Ltd. (Taan) was created as a division of HaiCo (Haida Enterprise Corporation) to manage Haida Nation timber harvesting interests.
- In December 2010, the Haida Gwaii Land Use Objectives Order ("HGLUOO"), which establishes legal objectives for forest-based values to support implementation

of ecosystem-based management and to protect important Haida cultural values, was agreed to by the Haida Nation and the Province of BC and came into effect. The HGLUOO outlines land use objectives reflecting the intents expressed in the Haida Gwaii Strategic Land-Use Plan Agreement and establishes land use objectives specific to Haida Gwaii under the authority of the Haida Gwaii Reconciliation Act for the purposes of the Forest and Range Practices Act. Also at this juncture, 11 new protected areas were created.

- In a July 2010 letter to the Executive Director of Misty Isles Economic Development Society (MIEDS), then Minister of Forests and Range Bell invited MIEDS to apply for a community forest agreement (CFA). An undated memorandum from then Minister of Forests, Lands and Natural Resource Operations Thompson set out an allocation of 80,000 m^3 from the Haida Gwaii TSA 25 for a Haida Gwaii CFA (Moore Resource Management 2016).
- In 2011, Taan Forest Products Ltd. began to manage TFL 60, assuming the TFL management responsibilities formerly handled by WFP.
- In 2011, Taan completed a series of assessments and reports to become a Forest Stewardship Council (FSC) certificate holder.
- In March 2012, the province of BC and the Haida Nation concluded an "Atmospheric Benefit Sharing Agreement" that awards ownership of offset credits created through any offset projects on Haida Gwaii connected to the implementation of the Haida Gwaii Strategic Land Use Agreement and provides the basis for a sharing of offset credit revenues between the two parties.
- In the April 2012 AAC rationale, the HGMC set forth an AAC of 929,000 m^3 for Haida Gwaii, a 47.8% reduction from the previous level of 1,780,092 m^3 (HGMC 2012).
- In June 2012, Taan completed the purchase of TFL 60 from WFP (Taan 2016).
- In September 2012, the Chief Forester set forth determinations of AACs for each of TSA 25, TFL 58 and TFL 60, which were consistent in the aggregate with the HGMA AAC determination of the HGMC. In addition, the Chief Forester, in his AAC rationale, set out direction in the form of targets with respect to the harvesting of cedar on the Haida Gwaii TSA and TFLs (Sutherland 2012).
- Between 2012 and 2016, the HGMC sponsored a forestry strategy development process, which included a detailed background discussion paper released in 2013 and revised in 2015, and a community forum in 2015, which resulted in a follow-up summary document. However, a Haida Gwaii forestry strategy has not moved past this last stage to date.

- (Haida Nation owned) Great Bear Carbon Credit Limited Partnership's carbon offset project plan was accepted in June 2013. This project documented greenhouse gas (GHG) emission reductions realized by avoiding the release of carbon associated with timber harvesting, road building, and other forestry operations in the newly created Haida Gwaii conservancies (referred to as Haida Heritage Sites) and implementation of ecosystem-based management (EBM) operating areas relative to a timber harvesting baseline without these two measures (Offsetters 2016). The life of the project extends from January 2011 to December 2035, and the project is expected to annually generate approximately 400,000 offset credits that can be marketed and sold into regulated and voluntary offset credit markets.
- In December 2016, A&A Trading (Haida Gwaii) Ltd. completed the purchase from Teal Cedar of TFL 58, located on Moresby Island, and Forest Licence A16870.
- In an October 24, 2017 letter, the Chief Forester acknowledged that the logging of cedar in TSA 25 "has exceeded the levels outlined in the chief forester's 2012 management unit AAC determinations", and established a partition of no more than 195,000 m^3 of cedar within TSA 25's AAC of 512,000 m^3. On August 24, 2018, the minister followed up this step by signing a cedar focused partition order under Section 8(5) of the *Forest Act* applicable to TSA 25 eligible licences (which are replaceable forest licences). This order included direction to BCTS to follow up on the intent of the cedar partition order.
- In a December 2017 letter from the Regional Executive Director of the West Coast Forest region to the Chair of MIEDS, the Province of BC invited MIEDS to submit an application for a Community Forest Agreement (CFA). The offer included a specific mapped area, an offer of a transitional tenure with an AAC of 80,000 m3, and a condition that 55,000 m^3 per year of the Haida Gwaii area-based CFA's AAC would be re-directed to BCTS for the purposes of entering into one or more BCTS licences.
- In August 2018, the BC Court of Appeal issued a decision upholding a January 4, 2017 Labour Relations Code decision that Section 2 of the Woodlands Letter of Understanding (WLOU) that forms part of the Collective Agreement between United Steelworkers Local 1-1937 and Western Forest Products and its successor Taan Forest Products was discriminatory against members of the Haida Nation in the context of their forest industry employment with Taan Frest Products on Haida Gwaii. The decision upholds Taan's initiatives to use multiple and/or non-union contractors who are either Haida Nation members or are companies with Haida Nation member ownership to undertake timber harvesting related work on TFL 60.

3 Haida Gwaii Socio-Economic Setting

3.1 Introduction

Haida Gwaii is an archipelago of more than 150 islands to the north of Vancouver Island, from which it is separated by Queen Charlotte Sound and Hecate Strait. The mainland north coast of BC lies 80 km to the east across Hecate Strait, and the state of Alaska lies to the north across Dixon Entrance. Haida Gwaii's total landmass of just over a million hectares is situated mostly in two main islands, Graham Island to the north and Moresby Island to the south.

Haida Gwaii is the current, historical and ancient home of the Haida people. Two major Haida communities are located on Graham Island, Old Massett at the north end on the shores of Massett Inlet and Skidegate in the island's southeast corner. Three incorporated municipalities are located on Haida Gwaii; Village of Queen Charlotte on the southern shore of Graham Island, Port Clements on the eastern shores of Massett Inlet and Masset on the northern shores of Massett Inlet. Electoral Area D of the North Coast Regional District encompasses Graham Island and its surrounding islands. The unincorporated communities of Tlell and Tow Hill are situated on Graham Island. Electoral Area E of the North Coast Regional District encompasses Moresby Island and its surrounding islands. The unincorporated community of Sandspit is situated on Moresby Island.

The islands' largest airport is located at Sandspit. Air Canada operates a daily flight between Vancouver and Sandspit. Inland Air operates daily float plane flights on weekdays between Prince Rupert and Masset. Pacific Coastal Airlines operates a daily flight between Masset Municipal Airport and the Vancouver Airport's South Terminal. A BC Ferries vessel traverses Hecate Strait twice per week during the fall, winter and spring months between Prince Rupert and Skidegate, and five times per week during the summer months. BC Ferries provides about 10 crossings per day on a 20-minute ferry route between Skidegate and Alliford Bay that links Graham and Moresby islands.

Other than logs, most commercial goods are transported to and from Haida Gwaii in trucks that travel on the BC Ferries service. Seaspan offers a flat deck towed barge service that transports logs between Haida Gwaii and the Port of Prince Rupert and between Haida Gwaii and the Lower Mainland. North Arm Transportation operates a bulk fuel barge service and a freight barge service between Masset and Mitchell Island (Vancouver) and has a bulk freight storage facility at Masset. Wainwright Marine offers a freight and equipment barge service between Haida Gwaii and Prince Rupert. Port Clements-based O'Brien & Fuerst also has two barges. Haida Gwaii has no port facilities.

Approximately half of Haida Gwaii is in a protected status, such as a provincial park or a conservancy. About 148,000 hectares are considered currently suitable and available for harvesting timber. Nearly 478,008 hectares are in protected areas collaboratively managed by

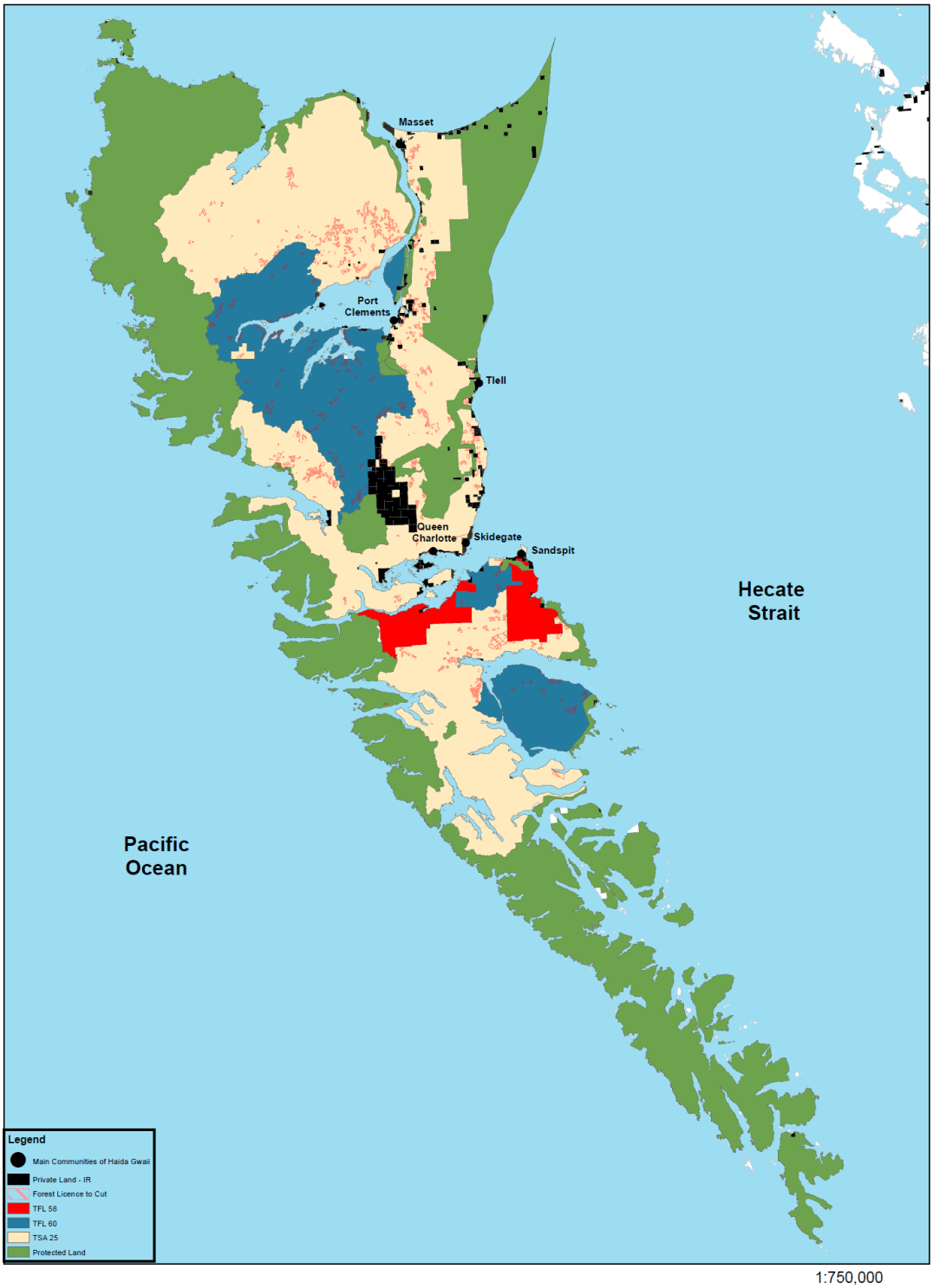
the Haida Nation and the Province of BC. Haida Gwaii protected areas also include the 145,700 ha Gwaii Haanas National Park Reserve and Haida Heritage Site, which was established in 1988. This area, on the southern end of Moresby Island and numerous smaller adjacent islands is cooperatively managed by the Haida Nation and the Government of Canada.

The vast majority of the lands on which timber harvesting is allowed is contained within three areas, Haida Gwaii Timber Supply Area (TSA) and Tree Farm License 58 (TFL 58) and Tree Farm License 60 (TFL 60). The Haida Gwaii TSA is located primarily on Graham Island, with a smaller portion on northern Moresby Island. The TSA has a gross area of 339,000 hectares, and a long-term timber harvesting land base estimated at 77,900 hectares. TFL 58 is held by A&A Trading (Haida Gwaii) and comprises the land in the former Moresby Block, which was subdivided from TFL 47 on December 1, 2006, and which is located immediately adjacent to the community of Sandspit. The TFL's gross area is 23,900 hectares, with a long-term timber harvesting land base of 10,400 hectares.

TFL 60 is held by Haida Nation-owned Taan Forest Ltd. and comprises the land which was formerly in Block 6 of TFL 39 that was subdivided from that TFL effective January 15, 2010. The TFL has a gross area of 134,500 hectares, with a long-term timber harvesting land base of 48,000 hectares.

Below is a map of Haida Gwaii showing the extent of its protected areas, main communities, and the boundaries of Haida Gwaii TSA, TFL 58 and TFL 60.

Figure 3-1: Map of Haida Gwaii



Source: BC MFLNR 2018a

3.2 Population and Demographics

Declining population, -12.8% over the 2006-2016 period

Haida Gwaii's population has been on a steady decline since its most recent peak in 1996 (at approximately 5,600). Based on Census of Canada data, the 2016 population of Haida Gwaii was 4,198, a 12.8% decrease from the 2006 population of 4,812, and a 25.0% decrease from the 1996 population. By comparison, the overall population of BC rose by 12.2% over the 2006-2016 period.[21]

BC Stats' population estimate for the Queen Charlotte local health area of 4,848 in 2006 and 4,280 in 2016 are similar to population estimates based on Census of Canada data.[22]

All but one of Haida Gwaii's communities or electoral areas registered a population decline over the 2006-2016 period. Skidegate was the exception as its estimated population grew modestly from 781 to 837 over this decade. Port Clements experienced the largest drop in population (-35.9%) from an estimated 440 in 2006 to 282 in 2016. Table 3-1 presents the 2006 and 2016 populations of Haida Gwaii and its communities.

Table 3-1: Population of Haida Gwaii and Haida Gwaii Communities and Electoral Areas, 2006 and 2016

	2016	2006	Percentage Change
Haida Gwaii	4,198	4,812	-12.8 %
Skidegate	837	781	7.2 %
Old Massett	555	694	-20.0 %
Village of Queen Charlotte	852	948	-10.1 %
Village of Masset	793	940	-15.6%
Village of Port Clements	282	440	-35.9 %
Electoral Area D, North Coast Regional District (Graham Island)	539	607	-11.2%
Electoral Area E, North Coast Regional District (Moresby Island)	340	402	-15.4%

[21] Statistics Canada does not present a population figure for Haida Gwaii based on Census of Canada data. In order to estimate the population of Haida Gwaii, the populations of the Haida communities of Skidegate and Old Massett, Village of Queen Charlotte, Village of Masset, Village of Port Clements, and Electoral Areas D (Graham Island) and E (Moresby Island) of North Coast Regional District (formerly Skeena-Queen Charlotte Regional District) must be summed together.

BC Stats however estimates populations by local health area and school district by year. The Queen Charlotte local health area (LHA 050) and School District no. 50 encompass the whole of Haida Gwaii.

[22] Census of Canada population statistics are relied upon in this report because they are available for all Haida Gwaii communities (including Haida Nation communities) and because detailed demographic data by Haida Gwaii communities are also available through the Census of Canada databases. The Census population estimates typically demonstrate a small undercount of approximately 2%.

Source: Statistics Canada 2007 and 2017 and author's calculations

The main reason for the Haida Gwaii population decline is that out-migration from the islands has greatly exceeded its in-migration. Haida Gwaii had a small natural population increase (i.e. births exceeding deaths) over the five-year 2013-17 period; Haida Gwaii's natural increase averaged approximately 15 persons (average of approximately 46 births and 31 deaths). By comparison, the growth in the BC population over this recent five-year period occurred mainly through a net increase in the province's migration, both from other provinces and other countries. The net increase in the province's population due to migration has been about five times larger than the province's natural increase.

BC Stats prepares population (historical) estimates and (forward) projections by local health area and school district using Census data and data from other sources. The BC Stats projections show the Haida Gwaii local health area's population increasing by a nominal amount over the short-term (for example, 1.5% over the five-year 2016-2020 period).[23] BC Stats has projected a small population increase for Haida Gwaii in the recent past that has not panned out. As previously mentioned, a very small natural increase (i.e. births exceeding deaths) is present within the Haida Gwaii population but the author of this report forsees the future Haida Gwaii population in the short- and medium-terms being stable at best and the Haida Gwaii population may decrease if out-migration continues to outweigh in-migration by a large margin on the islands.

Almost half of the Haida Gwaii population identifies as an Aboriginal/Indigenous person

In 2016, an estimated 47.5% of the Haida Gwaii population identified as an Aboriginal/Indigenous person.[24] The Aboriginal/Indigenous population of Haida Gwaii was an estimated 1,915 in 2016 and is growing (a 1.6 % increase for the 2006-2016 period), unlike the non-Aboriginal/Indigenous population of the islands. However, this Haida Gwaii Indigenous population growth of 1.6% trailed, by a large margin, the 38% increase in the overall BC Aboriginal/Indigenous population.

Both Skidegate and Old Massett are amongst the small group of larger Aboriginal/Indigenous communities within the province but the Haida Gwaii Aboriginal/Indigenous population makes up only about 0.7% of the province's total Aboriginal/Indigenous population. Table

[23] See https://www.bcstats.gov.bc.ca/apps/PopulationProjections.aspx

[24] The Census of Canada data for estimates of the Aboriginal/Indigenous population are based upon voluntary disclosure of Aboriginal/Indigenous identity and voluntary participation in the Census of Canada. The shown estimate of the Aboriginal/Indigenous population is therefore likely to be an under-estimate of the actual Aboriginal/Indigenous population of Haida Gwaii and its communities. The shown percentage share is based upon the Haida Gwaii residents who answered the question about Aboriginal/Indigenous identification, which is a slightly smaller number of Haida Gwaii residents (4,030) than who participated in the Census of Canada (4,198 persons) in 2016.

3-2 presents estimates of the Aboriginal/Indigenous population of Haida Gwaii and its communities and electoral areas for 2016 and 2006.

Table 3-2: Aboriginal/Indigenous population of Haida Gwaii and its communities and electoral areas, 2006 and 2016

	2016	2006	Percentage Change
Haida Gwaii	1,915	1,885	1.6 %
Skidegate	720	710	1.4 %
Old Massett	540	670	-17.9 %
Village of Queen Charlotte	140	135	3.7 %
Village of Masset	350	320	9.4 %
Village of Port Clements	50	10	400 %
Electoral Area D (Graham Island)	100	20	400 %
Electoral Area E (Moresby Island)	25	20	24 %

Source: Statistics Canada 2007 and 2017 and author's calculations

Population of Haida Gwaii is older

The estimated median age of the Haida Gwaii population increased from 39.7 years to 45.1 years over the 2006-2016 period. By comparison, the estimated 2006 median age on the islands was similar to that of the province (40.8 years) whereas by 2016, the estimated Haida Gwaii median age (45.0) was higher than the BC median of 43.0 years.

The median age of the Village of Queen Charlotte went up from 41.1 years to 45.8 years over the 2006-2016 period (11.4%), and the median age of Port Clements went from 43.2 years in 2006 to 52.2 years in 2016 (20.8%). In terms of the Haida Gwaii population age exceeding the BC median age, the Haida community of Skidegate is the exception on the islands although its median age also increased over the 2006-2016 period, going from 36.8 years to 40.0 years in 2016.

Excepting Port Clements and Electoral Area E (Moresby Island), the median ages of Haida Gwaii communities in 2006 were near or well below the provincial median age. In 2016 only the Haida communities of Skidegate and Old Massett had median ages near or below the provincial median age. This upward shift over the 2006-2016 period in the median ages of Haida Gwaii communities was due to weak in-migration to Haida Gwaii and the Haida Gwaii population having a lower birth rate (because of its aging population). Table 3-3 shows the median ages of the Haida Gwaii communities and electoral areas.

Table 3-3: Median Ages of Haida Gwaii Communities and Electoral Areas (years), 2006 and 2016

	2016	2006	Percentage Change
Haida Gwaii	45.0 years	39.7 years	13.3%
Skidegate	40.0	36.8	8.9 %
Old Massett	42.4	35.2	20.5 %
Village of Queen Charlotte	45.8	41.1	11.4 %
Village of Masset	46.2	40.7	13.5 %
Village of Port Clements	52.2	43.2	20.8 %
Electoral Area D (Graham Island)	45.6	38.5	18.4 %
Electoral Area E (Moresby Island)	50.9	45.5	11.9 %

Source: Statistics Canada 2007 and 2017 and author's calculations

Stable core population but limited in-migration

Haida Gwaii and BC have similar levels of medium-term community stability based on duration of residency. The percentage of BC residents who resided within the same community over the 2012-2016 period was 79.1%. This level indicates a high level of medium-term community stability. The percentage of Haida Gwaii residents residing within the same community over the same 5-year period was slightly higher, 82.0% (Statistics Canada 2017).[25]

Comparing this indicator of community stability with the decline in population for Haida Gwaii points to out-migration exceeding in-migration on the islands (i.e. a core group of residents is staying on Haida Gwaii but some persons are leaving to reside elsewhere and few are coming to the islands to reside for the long-term on Haida Gwaii).

3.3 Labour Market

Introduction

Labour market, as applied in this report, is defined as the exchange of the supply of labour by workers for the demand of labour by employers. Labour is supplied by workers with the relevant skills and associated occupational training, and is drawn from Haida Gwaii residents, as well as workers from other areas. Labour demand correlates with the number of positions of the necessary skills at the time required to carry out forest industry activities. Total labour demand also incorporates labour demand of supplier industries (i.e., indirect employment) connected to the expenditures on goods and services by forest sector enterprises and organizations and labour demand by consumer industries (i.e., induced employment)

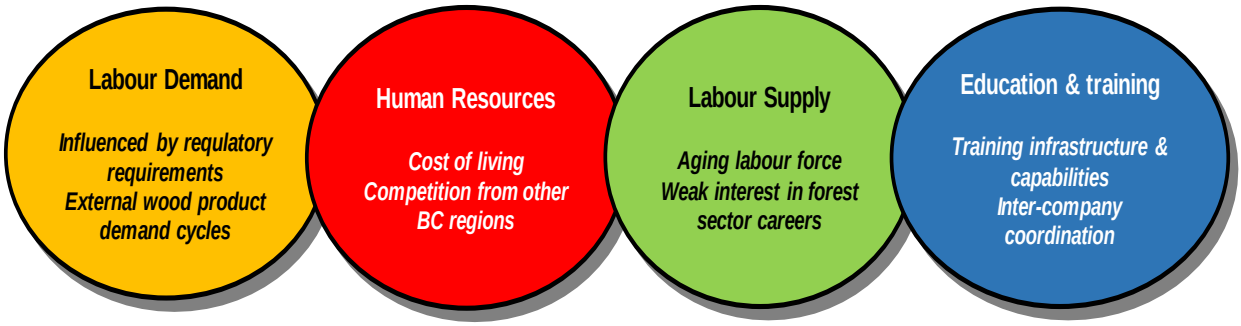
[25] This determination of community stability is based on mobility status data, which refers to the status of a person with regard to a person's place of residence on the reference day of May 10, 2016 in relation to the place of residence on the same date five years earlier.

connected to the household expenditures of forest sector associated direct and indirect workers.

Labour markets are fluid and dynamic; they fluctuate both in terms of the numbers of labour force participants and the number of positions available through employers. These fluctuations often create periods of labour scarcity or labour surplus. Labour market forces (e.g., changing terms of employment and labour mobility) typically establish a balance between supply and demand. Provincial and federal initiatives supporting workers and employers also contribute to effective labour market functioning.

The human resource management activities of companies provide a key linkage between matching up sectoral labour demand and labour supply and reducing frictions between the two economic forces. Education and training initiatives delivered by companies to employees and by government entities and specialized non-governmental organizations have fundamental implications for improving the quality of labour supply and shaping labour supply to the labour demand of various sectors. Figure 3-2 is a graphic that presents several of the main issues or challenges in the Haida Gwaii labour market as identified through the interviews with key informants carried out for this project and a review of secondary sources, such as the Haida Gwaii Labour Market Information Report (Astute Management Consulting 2011), Human Resource Development on Haida Gwaii (Mills 2012), BC Forest Sector Labour Market & Training Needs Analysis (LMI Insight and Malatest 2013), and Labour Market Supply Side Environmental Scan for BC's Natural Gas Sector (Ingenia Consulting 2012).

Figure 3-2: Haida Gwaii labour market issues and challenges



Shrinking labour supply

Haida Gwaii's declining population over the 2006-2016 period was largely driven by the contraction in its resident labour supply. The islands resident labour force decreased from an estimated 2,830 workers to 2,290 workers over this period, a decline of 19.1%.[26]

All Haida Gwaii communities excepting Skidegate registered sizeable contractions in their labour supply during this period. The Haida Gwaii communities with the largest drops were Electoral Area D (Graham Island), -45.5%, and Electoral Area E (Moresby Island), -45.3%, and the labour supply contractions in these communities were associated with lower numbers of residents holding down positions in logging, public administration and retail trade in 2016 compared to 2006. The growth (24.7%) in the Skidegate labour force was likely due in large measure to the emergence and development of HaiCo and its subsidiaries.

Table 9-1 and Table 9-2 in Appendix II present data on the Haida Gwaii labour force for 2006 and 2016 by industry (at the 2 digit North American Industry Classification System (NAICS) level).

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[26] This labour force data is from the Census of Canada and based on "place of residence", i.e. these workers constitute the labour force members who had their usual place of residence (i.e. permanent residence) on Haida Gwaii at the times of Census enumeration. Statistics Canada also collects and reports labour force data by "place of work". Sometimes the "place of residence" and "place of work" labour force data are used interchangeably, which can be misleading in many BC situations. Within BC metropolitan regions, extensive daily commuting between communities is present, for example Surrey to Vancouver. As well, substantive volumes of long distance commuting also occurs between far flung areas in BC and between BC and Alberta. For example, a portion of Elk Valley coal mine workers have their permanent residence in Alberta and a portion of Alberta oil sands facility operations and construction workers have their permanent residences in BC. The workers who engage in long distance commuting are often referred to as "mobile workers" and several studies have been undertaken of this group of workers by Statistics Canada and a several year multi-university research project, entitled the "On the Move Partnership" (see http://www.onthemovepartnership.ca/about/) has yielded multiple publications on the topic.

The place of work by industry labour force data does not accurately identify or describe the total labour force of an area because a portion of the labour force reports "no fixed workplace address" as the location or address of their usual workplace. In the 2016 Census, overall in BC, 14.1% of workers reported having "no fixed workplace" (Statistics Canada 2017a). The workers reporting no fixed workplace are not included in the reporting of the place of work labour force data by industry for a community or rural area. This situation results in an underreporting of the total labour force of an industry when a portion of an area's or a community's labour force reports "no fixed workplace" in the Census. The usual place of work labour force data for a community can be divided into workers having local addresses and those with a permanent residence outside the local community in order to indicate the scale of non-local workers but this data breakdown does not include the workers with "no fixed workplace". The reporting of workplace location by Haida Gwaii residents gives an indication of the scale of this matter on Haida Gwaii. For example, in the 2016 Census, 19.6% of the labour force residing in Haida Gwaii reported having "no fixed workplace" (Statistics Canada 2017b). As an example of this matter, 24.4% of workers who reside in Port Clements reported in the 2016 Census as having "no fixed workplace address". Given the longstanding prominence of logging in the Port Clements area this response is expected. These workers residing in Port Clements likely work in the forested lands of Electoral Area D but, because they are reported as having "no fixed workplace address" they would not be itemized in the Place of Work labor force data for Electoral Area D. The same issue also pertains to mobile workers who work part-time or seasonally on Haida Gwaii and report "no fixed workplace address". The result of this situation is an underreporting of the place of work by location data for Haida Gwaii.

Higher unemployment

The Haida Gwaii unemployment rate as of the 2016 Census of Canada was 9.5%. At that time, the provincial unemployment rate was considerably lower at 6.7%. The Haida community of Old Massett had the highest unemployment rate (18.6%) on the islands at that time. This high unemployment rate was a decrease from the 33.8% rate at the time of 2011 Census of Canada. The unemployment rate in the adjacent Village of Masset at the 2016 Census of Canada however was the lowest on Haida Gwaii, 3.6%

Haida Gwaii's participation rate of 67.5% in 2016 was higher than the BC rate of 63.9%, which shows a slightly higher attachment to the work force on the islands than in the province.

The proportion of the labour force having a full-time job and the average number of weeks worked were other areas in which the Haida Gwaii employment situation in 2016 was weaker than that of the province. Of those Haida Gwaii residents who worked in 2016, 36% did so at a full-time position and 64% worked either part-time or for part of the year. Considerably more BC residents who worked in 2016 held a full-time job, 46%. The average number of weeks worked in Haida Gwaii in 2016 was 38.1, almost 4 weeks less than the BC average of 41.8 weeks. This difference in full-time employment between Haida Gwaii and the province is due to the narrow focus of the economic structure of the islands on the tourism, forestry and public administration sectors. The local tourism sector especially has a high proportion of seasonal workers. A factor may also be a preference of some Haida Gwaii residents for part-time employment, which was reported in the 2011 Haida Gwaii labour market information report (Astute Management Consulting 2011).

Aging labour supply

People aged 25 to 54 years old are considered of core working-age because of their strong attachment to the labour market. A concerning aspect in general for the Haida Gwaii economy is the decline in Haida Gwaii residents of prime working age population. The estimated number and percentage share of persons residing on Haida Gwaii in the prime working age group of 25 to 54 years declined from 2,217 (45.7%) in 2006 to 1,669 (39.0%) in 2016. The decrease of 24.7% in Haida Gwaii's prime working age group was twice as much as the drop in the overall Haida Gwaii population. Over the same period, the 25 to 54 years age group in the province grew by 3.9%.

Static education levels

When compared to provincial education levels, the Haida Gwaii situation differs markedly in two categories, persons with no educational certificate and persons with a university degree. In 2016 in BC, 29.9% of the adult population held a university degree whereas a much lower portion of Haida Gwaii residents did so, 16.2%. An estimated 9.6% of BC adults in 2016 did not have an educational certificate (such as a high school diploma) but in Haida Gwaii the

share of adult residents without an educational certificate stood at 23.1%, which was more than double the provincial level.

When considered on a community basis, Village of Queen Charlotte has a similar educational makeup to that of the province. The other communities and areas of Haida Gwaii have higher percentages of adults without an educational certificate and lower percentages who hold a university degree. Table 3-4 presents the percentage distribution of highest education achievement for Haida Gwaii, BC, Queen Charlotte and the rest of Haida Gwaii for 2016.

Table 3-4: Percentage distribution of highest education achievement for Haida Gwaii, BC, Queen Charlotte and the rest of Haida Gwaii (%), 2016

	No certificate, diploma or degree	High school diploma (or equivalent)	Apprenticeship or trades qualifications	College certificate or diploma	University qualification below bachelor degree level	University graduation
Haida Gwaii	23.1%	25.5%	12.2%	20.5%	2.4%	16.2%
BC	9.6	26.5	9.1	20.9	3.9	29.9
Village of Queen Charlotte	13.8	19.1	6.4	25.5	2.1	33.0
Rest of Haida Gwaii	25.5	27.2	13.7	19.2	2.5	11.8

Source: Statistics Canada 2017 and author's calculations

The numbers of local grade 12 students and high school graduates also have a general effect on the Haida Gwaii labour supply as this group is an important source of entry level part-time and full-time workers. In recent years the number of Haida Gwaii grade 12 students averaged about 47 and the number of high school graduates averaged about 35, which represents a very modest potential addition to the local labour force, especially given that a proportion of these young people will opt to reside elsewhere for educational and career reasons.[27]

As well, the high school graduation rate on Haida Gwaii lags the province-wide rate but oscillates widely on a year to year basis. The five-year range, 2012-13 to 2016–17, for the six-year Dogwood Diploma completion rate for Haida Gwaii was 60-82% and 75-90% for the middle 50% of BC school districts.[28]

Only a limited number of forest sector specific education and training opportunities are available on the islands. Possibly the most prominent of which are the 14 week programs for university students that are delivered in a partnership between the non-profit Haida Gwaii Higher Education Society (HGHES) and the University of BC faculty of forestry.[29]Starting

[27] See http://www.bced.gov.bc.ca/reports/pdfs/graduation/050.pdf

[28] See http://www.bced.gov.bc.ca/reporting/systemperformance/?evidence=completion-rates&sd=050

[29] See http://hghes.ca/

from the first offering in 2010, this Haida Gwaii program has grown and become a unique higher education offering focused on resource management and community development.

The implications of this smaller labour supply, in combination with an aging population and lower education levels, for the local economy has been discussed and described on the islands (Mills 2012). The locally developed "Human Resource Development on Haida Gwaii Strategies and Action Plan" included the following observations

- Decline in the core labour pool will challenge Haida Gwaii employers in filling future occupational demand from the Island labour pool.
- Anecdotally there is a paucity of senior management, leadership, administration, project management and operational management skills on Island.
- A shortage of business/management skills on Island will impede full development of self-employment and entrepreneurial opportunities.

A Haida Gwaii labour market research project commissioned by Gwaii Trust is underway (pers. comm. C. Lutner 2018). This labour market study is expected to be publicly available in 2019.

3.4 Economic Structure

The resident labour forces of each of Haida Gwaii's main economic sectors of forestry, tourism and public services have contracted in recent years

Haida Gwaii's economy is narrowly focused on forestry (mainly logging), tourism (mainly sport fishing, Haida culture and Haida Gwaii ecological experiences) and public services, including elementary and high school education, health care and government administration. They are the main sectors bringing in revenues and employing Haida Gwaii residents (and long distance commuters) which support spending by local businesses and residents at local retail outlets, on local real estate, on locally provided professional services and on other locally provided services. In 2016 (based on Census of Canada resident labour force data) the forestry sector accounted for 12.7% of the Haida Gwaii economy, the tourism sector for 16.9%, and the public services sector for 27.9%.[30]

[30] Statistics Canada neither organizes nor presents its labour force data to include figures for a "tourism sector". BC Stats developed an approach to estimate tourism sector employment by community and local area (including for Haida Gwaii) using Statistics Canada labour force data (Horne 2009b). BC Stats has not created an estimate for 2016 for the labour force of the tourism sector by local area. For its 2009 report, BC Stats also created specific definitions for the "forestry sector" and a "public sector".

This BC Stats estimation approach was used for this report to estimate the labour forces of the Haida Gwaii tourism, forestry and public sectors for 2006 and 2016. The 2006 figures reported here are slightly different than those reported by BC Stats in its 2009 report because the underlying datasets used for this socio-economic report, although also originally sourced from Statistics Canada, are different from the ones used by BC Stats.

Table 3-5 presents Haida Gwaii's labour force numbers and percentage shares by major sector for 2016 and 2006.[31]

Table 3-5: Haida Gwaii Labour Force (# of workers), 2016 and 2006[32]

Sector	2016 #	2016 %[33]	2006[34] #	2006 %	% change 2016 vs 2006
Total	2,290	100	2,830	100	-19.1%
Tourism	387	16.9	427	15.1	-9.4%
Forestry	290	12.7	325	11.5	-10.8%
Public Services	640	27.9	795	28.1	-19.5%
Other Sectors	973	42.5	1,283	45.3	-24.2%

All accommodation employment is typically categorized as being part of the tourism sector. However, some employment in several other sectors, including food services, recreation, transportation and retail trade, is due to tourism activity. The BC Stats approach is based on multiplying the accommodation services employment data by an estimated factor to capture the employment in other sectors that is supported by tourist visitation in order to estimate direct employment for the overall tourism sector. Areas with accommodation services (such as full-service resort hotels) that provide a range of services, such as food services, recreation, local transport and retail in addition to accommodation, have lower tourism direct employment factors. This estimated factor differs by area largely on the basis of the main types of accommodation facilities and the type and scale of the major recreation facilities. In areas where the accommodation facilities offer a full range of services in addition to overnight accommodation then the revenues and employment in other industries tends to be lower, and accordingly the direct tourism ratio or factor is lower. In BC, we see this in the major ski resort areas and in the areas with fishing resort and backcountry lodges.

The forestry sector is defined here in a similar way that BC Stats adopted for its aforementioned 2009 study. The forest sector is defined as comprising the following North American Industry Classification System (NAICS) code industries: 113 Forestry and Logging, 1153 Support activities for forestry, 3211 Sawmills and wood preservation, 3212 Veneer, plywood and engineered wood product manufacturing, 3219 Other wood product manufacturing, 322 Paper manufacturing, and 337 Furniture and related product manufacturing.

The public sector is defined here in a similar same way that BC Stats adopted for its aforementioned 2009 study. The public sector comprises the following NAICS code industries: 621 Ambulatory health care services, 622 Hospitals, 623 Nursing and residential care facilities, 61 Educational services, 9111 Defense services, 9112 Other federal services (9112 to 9119), 624 Social assistance, 912 Provincial and territorial public administration, 913 Local, municipal and regional public administration, and 914 Aboriginal public administration.

31 This labour force data are from the Census of Canada and is based on "place of residence", i.e. the workers who constitute the labour force members who had their usual place of residence (i.e. permanent residence) on Haida Gwaii.

32 The "# of workers" term refers to both full-time and part-time workers. The labour force question used by Statistics Canada relates to the individual's job held during the week of Sunday, May 1 to Saturday, May 7, 2016. However, if the person did not work during that week but had worked at some time since January 1, 2015, the information relates to the job held longest during that period. Employment at Haida Gwaii resorts is higher in the summer months than in May but the framing of the question captures workers who may not be working in May but who will likely be working in a month or so.

33 The percentage share shown in this table is the percentage or share of the total labour force. In the 2009 BC Stats reports, the percentage or share of only the "basic sector" is shown, i.e. forestry's percentage/share of the basic sector.

34 The 2006 data shown in this table differs slightly from the employment tables by sector shown in the 2006 Economic dependency tables for forest districts published by BC Stats and reproduced in the 2012 Haida Gwaii Timber Supply Review Public Discussion Paper. The difference is mainly due to different labour force source data.

Source: Statistics Canada 2007 and 2017; unpublished runs of Statistics Canada 2006 and 2016 labour force data supplied to BC Stats; and author's calculations

The labour force numbers and percentage shares for these leading local sectors declined substantively between the 2006 and 2016 Census years. The tourism sector's labour force went from an estimated 427 workers in 2006 to 387 workers in 2016, a 9.4% decrease. The forest sector's labour force decreased from an estimated 325 to 290 workers, a 10.8% decline and the public services labour force also went down from an estimated 795 workers in 2006 to 640 workers in 2016, a 19.5% decrease. These labour force figures include full-time, part-time and seasonal workers. A sectoral breakdown by duration of employment is not available for Haida Gwaii but in BC, the forestry and public administration sectors have a much higher share of full-time workers than does the tourism sector.

BC Government forestry related employment in the Haida Gwaii offices of BC MFLNR and BCTS is categorized by Statistics Canada in the "public administration" industry and not within a forest sector industry so this government related forestry employment appears within the public services sector and not within the forestry sector in Table 3-5. Over the 2015-2017 period, BC MFLNR has maintained an average annual staffing level of 22 full-time employees and 1 to 4 part-time employees (pers. comm. D. Sherban 2018).

Another way of looking at labour force trends is by examining 2 digit NAICS code industry data that is publicly reported by Statistics Canada for census years. The labour force data based on the 2 digit NAICS code description of industries shows a similar pattern of contraction for the main Haida Gwaii industries or sectors excepting for the health care and social assistance industry (11.5% increase). The Haida Gwaii resident labour force for accommodation and food services outlets decreased by 35.6%, a lower figure than the -9.4% estimate for the overall tourism sector. This is likely due to lower food service employment and higher employment in some other tourism related outlets, such as the Haida Heritage Centre at K̲ay Llnagaay. The manufacturing sector's labour force, which includes wood processing and fish and seafood processing, contracted by more than half over the 2006-2016 period, 57.6%. Table 9-1 and Table 9-2 in Appendix II shows the estimated labour forces by all 2 digit NAICS code industries and Haida Gwaii communities and electoral areas, as well as for Haida Gwaii, for 2016 and 2006. Table 3-6 below summarizes labour force data by key Haida Gwaii industries at the 2-digit NAICS code level.

Table 3-6: Haida Gwaii labour force for selected industries at 2 digit NAICS code level, 2006 and 2016

2 digit NAICS code Industry	2016 #	2016 %	2006 #	2006 %	% change 2016 vs 2006
Total (all industries)	2,290	100	2,830	100	-19.1%
Accommodation and food services	190	8.3	295	10.4	-35.6%
Agriculture, forestry, fishing and hunting[35]	320	14.0	360	12.7	-11.1%
Manufacturing	70	3.1	165	5.8	-57.6%
Educational services	175	7.6	235	8.3	-25.5%
Health care and social assistance	290	12.7	260	9.2	11.5%
Public administration	225	9.8	300	10.6	-25.0%
Construction	145	6.3	175	6.2	-17.1%
Retail trade	250	10.9	275	9.7	-9.1%

Source: Statistics Canada 2007 and 2017; and author's calculations

Both timber harvesting and wood processing employment of Haida Gwaii residents fell over the 2006-2016 period. The main factors contributing to declines in timber harvesting employment were as follows.

- lower Haida Gwaii AACs in response to creation of new protected areas and land use regulatory changes
- 2008 financial crisis that lowered demand for wood products in key markets (U.S. housing for example) resulting in less timber harvesting and associated forestry employment that recovered but not to the pre-financial crisis levels
- more use of mechanized (less labour intensive) harvesting methods
- timber harvest permitting challenges
- efforts to adhere to Chief Forester recommended cedar harvesting targets
- local sourcing challenges for forestry labour supply

The main factor in the reduction of wood processing employment on Haida Gwaii in 2016 compared to 2006 is the combination of adverse operational and financial challenges faced by Haida Gwaii Forest Products (formerly Abfam), which has a two-line sawmill at Port Clements. This facility was the only small scale, multi-species sawmill on the islands for several years but was shuttered in 2017 although re-opening and renovation of this facility are currently the subject of discussions between its owners and potential investors (pers. comm. D. Edgars 2018).

A current factor (and likely to be a more worrisome factor going forward) is the aging Haida Gwaii workforce in general and specifically in the local forest sector. This situation was

[35] Wood products manufacturing is part of the Manufacturing industry at the 2-digit NAICS code level

brought up by a few of the Haida Gwaii forest sector participants interviewed for this project. As well, the aging forest sector workforce is a well understood situation in the overall Coastal BC forest industries. For example a report providing a scan of coastal BC mayors' perceptions about the forest sector, observed that "Over the next decade the forest industry's aging workforce will lead to shortages in the professional, production management and skilled trade occupations, as well as a wide range of production workers who harvest and transport products from the forest to the market. An estimated 25,000 new recruits will be required in the sector or about 2,500 per year due to anticipated turnover rates of 60 per cent for forestry and logging and 40 per cent for the solid wood and pulp and paper sectors in BC." (The Truck Loggers Association 2016).

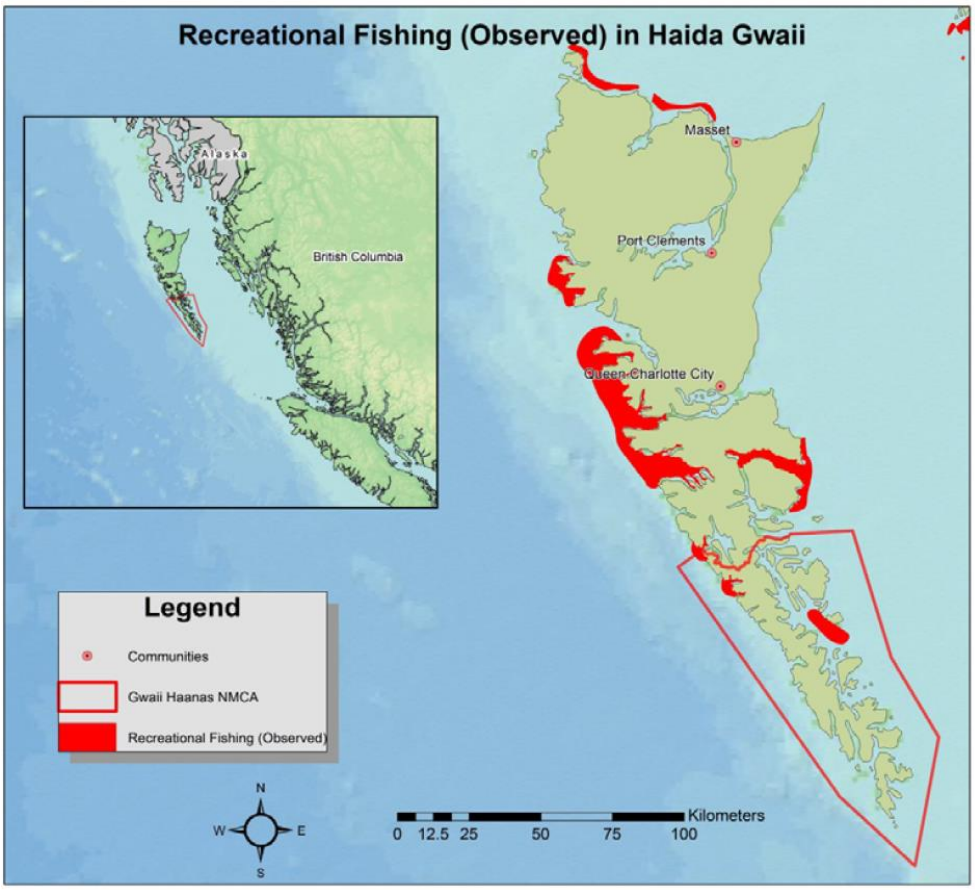
The factors affecting timber harvesting and processing activities are further discussed in later sections of this report (Section 4.6 Haida Gwaii Timber Harvest, Section 4.9 Haida Gwaii Forest Sector Operations, Section 4.10 Forest Sector Employment and Section 4.11 Haida Gwaii Timber Harvest Operating Costs).

Fishing resort lodges remain a driver of the Haida Gwaii tourism sector but the Haida culture and Haida Gwaii ecological tourism experiences have become important drivers of visitation to the islands over the past decade

The Haida Gwaii tourism industry has evolved since the late 1980s into what is now one of the islands' largest industries in terms of labour force size. The scaling up of this industry on Haida Gwaii was given a boost with the establishment of the first fishing lodge resort in 1985 on Langara Island, followed by the development of several others in the late 1980s, and with the signing of the South Moresby Agreement and the establishment of South Moresby National Park Reserve in 1988, followed by the Gwaii Hanaas Agreement in 1993 and the framing of the park reserve as Gwaii Haanas National Park Reserve, National Marine Conservation Area Reserve, and Haida Heritage Site.

Sport fishing activities on the islands largely occur off the west and northwest coasts of Graham Island. Sport fishing resort guests target chinook and coho salmon but other fish and seafood species, such as halibut, are harvested by recreational fishers as well. Based on anecdotal information, Figure 3-3 shows the main Haida Gwaii marine areas of recreational and sport fishing activities.

Figure 3-3: Main Haida Gwaii areas of Recreational and Sport Fishing Recreation



Source: Hillier et al 2007

A few of the major fishing resorts are owned by entities that also have major forest industry interests too.[36]

The long-term high level planning for marine based tourism on Haida Gwaii is now guided by the Haida Gwaii Marine Plan published in 2015 and developed through a collaborative process led by the Council of Haida Nation and the BC Government and, as well as, by the resort development policies and planning of each of the BC Government and the Haida Nation (Haida Nation and Province of BC 2015). The Marine Plan Partnership for the North

[36] Husby, through a subsidiary, owns and operates Peregrine Lodge at Naden Harbour and Haida Nation-owned HaiCo, which owns Taan Forest Products, also owns and operates Ocean House, a fly-in fishing lodge, and Westcoast Resorts, which includes the Lodge at Englefield Bay and the Lodge at Hippa Island. The owner of North Arm Transportation, which provides barge services to the forest sector, developed Langara Fishing Adventures, which operates Langara Fishing Lodge and Langara Island Lodge.

Pacific Coast (MaPP) was established as a collaborative process for implementing marine plans completed in 2015 for the coastal and marine areas of four sub-regions of B.C. including Haida Gwaii. The Haida Gwaii Marine Plan is being implemented by the Province of British Columbia and the Council of the Haida Nation

Table 3-7 sets out a recent listing of 16 fishing lodges on Haida Gwaii. This list does not itemize all tourist accommodation facilities or fishing charter boat operations on Haida Gwaii.

Table 3-7: Haida Gwaii Fishing Lodge Resorts

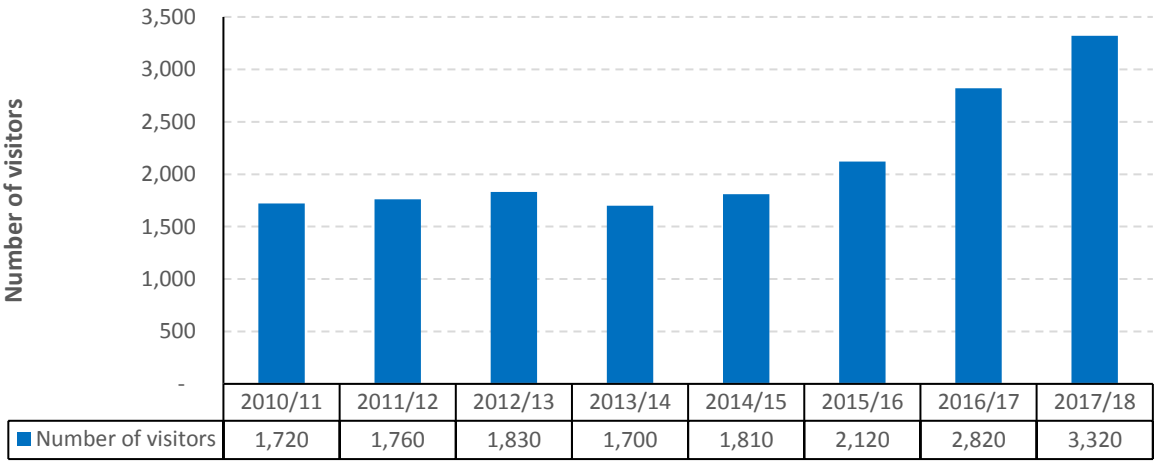
Lodge	Location	Company	Type
The Outpost	Port Louis	West Coast Fishing Club	On land
North Island Lodge	Langara Island (Beal)	West Coast Fishing Club	Floating
The Clubhouse	Langara Island (Henslung)	West Coast Fishing Club	On land
Langara Island Lodge	Langara Island (Henslung)	Langara Fishing Adventures	On land
Langara Fishing Lodge	Langara Island (Henslung)	Langara Fishing Adventures	Floating
Alaska View Lodge	Tow Hill Road	Langara Fishing Adventures	On land
Kumdis River Lodge	Port Clements	Langara Fishing Adventures	On land
The Lodge at Englefield Bay	Douglas Inlet	Westcoast Resorts (HaiCo)	Floating
The Lodge at Hippa Island	Nesto Inlet	Westcoast Resorts (HaiCo)	Floating
Queen Charlotte Lodge	Naden Harbour (SW side)	Queen Charlotte Lodge	On land
Peregrine Lodge	Naden Harbor (SE side)	Husby Forest Products	On land
Samson Lodge	Naden Harbor (NE side)	Samson Marine Resources	Floating
Queen Charlotte Safaris	Sandspit	NA	On land
Sandspit Adventures	Sandspit	NA	On land
Naden Lodge	Masset	NA	On land
Escott Lodge	Masset	NA	On land

Source: MFLNR 2018

A study of Haida Gwaii fishing lodges listed 18 facilities as of 2002 A 1996 report estimated that Haida Gwaii had 13 fishing lodges in 1994 (GS Gislason & Associates 2003). The 2003 report estimated that 115 jobs (50 PYs) at these Haida Gwaii fishing lodges were held by Haida Gwaii residents out of a total employment of 520 jobs (245 PYs), which means a modest 22% local share of fishing lodge total employment. In 2001, the overall Haida Gwaii tourism sector was estimated to account for employment of 292 Haida Gwaii resident workers (Horne 2009b). The estimated 115 jobs held by Haida Gwaii residents at the Haida Gwaii fishing lodges would have accounted for about 40% of the Haida Gwaii resident tourism labour force at that time.

The overall Haida Gwaii tourism sector has expanded since the early 2000s. For example, the estimated number of local workers in the Haida Gwaii tourism sector's labour force was about 390 in 2016. New or renovated infrastructure connected to tourism experiences and accommodations focused on Haida culture and the ecological and wilderness features of the islands have opened in recent years, which has somewhat lessened the relative economic importance of the fishing resort lodges within the Haida Gwaii tourism sector. For example, HaiCo opened two eco/Haida culture lodges in recent years, Ocean House at Peel Inlet in 2018 and Haida House at Tllaal in 2012 and the Haida Nation opened the Haida Heritage Centre at Kay Linagaay in 2007. In recent years, indicators of visitation show an upward trend for Haida Gwaii after a dip over the 2009-2011 years. For example, the number of visitors at the Queen Charlotte-Sandspit Visitor Information centre almost doubled to 10,116 in 2018 from 5,462 in 2011. In 2009 the number of visitors at this info centre had reached 10,448 (Destination BC 2019). The number of short-term rental units in private housing have increased. A recent report on Queen Charlotte housing observed that, as of March 2018, 39 rentals were listed on the Airbnb website versus 29 listings in December 2017 (Co+Host 2018). Another example of the growth in visitation connected to Haida culture and Haida Gwaii ecology and wilderness is the upward trend in visitation to Gwaii Haanas National Park. Over the 8-year 2010-11 to 2017-18 period, annual visitation to Gwaii Haanas National Park and Haida Heritage Site almost doubled from 1,720 to 3,320 visitors (see Figure 3-4).

Figure 3-4: Annual visitation to Gwaii Haanas National Park and Haida Heritage Site (number of visitors)



Source: Statista.com 2019

A new estimate of Haida Gwaii fishing lodge employment is in preparation. The MaPP issued a request for proposals in 2018 for a study of recreational service providers on Haida Gwaii that would develop up to date data on recreational fishing operations on Haida Gwaii, including employment, and a methodology to estimate the limits of acceptable change to

priority values affected by activities undertaken by recreational fishing service providers and implement the methodology for Haida Gwaii. Given the participation of HaiCo in the fishing resort lodge industry since its purchase in 2011 of a controlling interest in Westcoast Resorts and HaiCo's emphasis on local hiring, along with the interest of some other resort properties in local hiring, the Haida Gwaii resident share of fishing resort employment in recent years is likely to be higher than the 22% level reported in the 2003 study. The MaPP commissioned report is due to be completed in mid-2019 (MaPP 2018).

Data challenges in estimating Haida Gwaii economic activity

At the small area level, only labour force and employment by industry data are available through publicly available sources, such as Statistics Canada and BC Stats, to describe economic activity. In the Haida Gwaii case, Statistics Canada does not report data on a Haida Gwaii area basis so the data for the municipalities, electoral areas and Haida communities have to be aggregated or summed in order to create an estimate for Haida Gwaii. A challenge in this situation is that labour force and employment data for electoral areas and First Nation communities are not reported by Statistics Canada at the same granular level as for municipalities.

Another challenge with Haida Gwaii labour force data is the relatively high proportion of part-time workers. Many of these part-time workers work for the fishing resort lodges, the fish and seafood processing facilities, the retail outlets or in fish harvesting. In fact, many Haida Gwaii workers have a couple of part-time jobs over the course of the year. And some owner-operators are in a similar position as they have two or even three businesses or they have a part-time business and they work for another entity on a part-time or seasonal basis. At the time of the Census of Canada enumeration, persons who work in two or three different industries over the course of the year are identified with only one industry, such as accommodation services, so the reporting of labour force or employment by industry tends to be accurate in terms of the overall labour force figure but not accurate in terms of the labour force of industries that rely on sizeable numbers of part-time workers.

Yet another challenge related to assessing or estimating the Haida Gwaii labour force and its characteristics is that a portion of the workers in certain Haida Gwaii operations or industries, especially the fishing lodges and certain forestry activities, are filled by mobile workers (i.e. long distance commuters to Haida Gwaii) who have their permanent residence elsewhere in BC (or in Alberta in some cases). These mobile workers may stay on Haida Gwaii for a several month season or commute back and forth for shorter stays. Because their place of work on Haida Gwaii consists of one or more remote locations, many of these mobile workers will report "no fixed workplace address" in the Census enumeration so the labour force data by place of work for Haida Gwaii is much underreported.

In part, understanding the total employment and its key characteristics in the Haida Gwaii forestry and tourism sectors is met through surveys of employers in these sectors. For this socio-economic report, a survey of the main employers in the Haida Gwaii forestry sector was

undertaken and its results are reported in Section 4.9. As mentioned above, the MaPP has a research project underway that is expected to include a survey of Haida Gwaii fishing lodge operators, which will provide an up-to-date estimate of total employment and its characteristics in this key part of the Haida Gwaii tourism sector.

These data challenges do not negate the value of the Haida Gwaii labour force or employment data but these challenges suggest that interpretation of this data should focus on differences in scale (i.e. 50 vs 100) and on direction in temporal trends (i.e. positive or negative) and not on the precision or accuracy of the data.

The Haida Gwaii economy showed increasing diversity over the 1991-2006 time period[37]

A 2009 BC Stats study calculated an economic diversity index to compare economic diversity between areas in the province and change in an area's diversity over the 1991-2006 period. Haida Gwaii's diversity index in 2006 was similar to the typical range for most areas around the province (the provincial mean diversity value in 2006 was 69, the same diversity index value that Haida Gwaii scored). This movement towards greater economic diversity was due to increasing employment on Haida Gwaii in both the tourism and public administration sectors and a steep decline in forest sector employment. Over the 1991-2006 period, the share of Haida Gwaii's forest sector employment income within the overall Haida Gwaii economy fell by a substantial margin, a decrease in the same range as the decline in the Alberni, Port Hardy and Lake Cowichan areas on Vancouver Island.

This study also determined location quotients for areas throughout BC based on 2006 Census of Canada data (BC Stats 2009). Calculating location quotients is a way to identify areas of economic sector specialization or concentration within and between economies. A location quotient measures the concentration of industry sectors in an area relative to the concentration of the sector in the provincial economy. Haida Gwaii's tourism sector location quotient of 1.41 was relatively high within the province, and in the same range as Parksville-Qualicum, Penticton and the Gulf Islands for example, but well below the tourism sector concentration in the Squamish-Whistler, Invermere and Golden areas.[38]

A shift/share analysis was also prepared in the 2009 BC Stats study. This type of analysis uses employment data to isolate three broad determinants of economic change within an area: change occurring within the overall province, change occurring due to overall change within an industry (such as wood processing) and change due to local circumstances. Large local employment effects in either a positive or negative direction indicate that change in a sector

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[37] The calculation of this diversity index takes into account the 1997 standing down of Canadian Forces Station (CFS) Masset.

[38] The BC tourism sector would be rated as 1 within the overall BC economy. An area with a location quotient of 1 for its tourism sector would have a tourism sector of roughly similar economic importance to its economy as the BC tourism sector is within the overall BC economy.

industry cannot be easily explained by overall provincial employment changes or by changes in the industry. [39]

The shift/share analysis results for the 2001-2006 period showed a large positive local effect for the Haida Gwaii tourism sector, which suggests change pushed by local factors (rather than as a byproduct of positive change in the overall provincial tourism sector). The situation was the reverse for the Haida Gwaii forest sector; based on the shift/share analysis results, a large negative change in the Haida Gwaii forest sector for the 2001-2006 period was driven by negative local factors (Horne 2009a).

Although the Haida Gwaii tourism sector accounts for the largest share of the local labour force the tourism sector does not have the largest share of income

A 2009 BC Stats study of local economic dependencies based on 2006 Census data showed that the tourism sector of Haida Gwaii had employment and (before tax) income shares of 21% and 10%, respectively (Horne 2009b).[40] The economic importance of the resource extraction industries is more noticeable when the focus is on employment income. This study listed the Haida Gwaii forestry sector's shares of employment and income as 15% and 14%, respectively. The lower share of income for the Haida Gwaii tourism sector (compared to the forest sector) is due to its higher levels of seasonal and part-time employment and lower average hourly and weekly pay rates. The public sector accounted for the largest share of employment income on the islands, 33%, at the time of this study.

A key factor driving the higher employment income levels in the forest sector versus tourism is the considerably higher wage and salary structure in the various parts of the forest sector. A reason for the higher wage and salary (and benefit) levels, at least in certain parts of the forest sector, is the higher levels unionization amongst Coastal BC timber harvesting companies and in the larger wood processing facilities. For example, forest industry employers with current or recent Haida Gwaii operations , which are parties to the Collective Agreement with United Steelworkers Local 1-1937 include the following.

- A&A Trading (Haida Gwaii) Ltd.
- C.N.R. Salvage Ltd.
- DVR Trucking Ltd.

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[39] A key determinant of whether a region can develop its industry sectors is its ability to utilize comparative advantages, relative to other economies. For example, if a sector's main competitive factor is price and a region has access to a low cost supply of a commodity critical to that sector, then the region has a comparative advantage. A location quotient of 1.0 for a sector indicates that the region employs the same proportion of its labour force in that sector as the province does, and that the region has no comparative advantages or disadvantages. A location quotient of greater than 1.0 indicates that relatively more people are employed in that sector, and that there are comparative advantages at work. Conversely, a location quotient of less than 1.0 indicates that there are relatively fewer people employed in that sector, and that there are likely comparative disadvantages hampering further development.

[40] Most recently available BC Stats estimate of both tourism sector employment and income.

- Husby Forest Products Ltd.
- Island Timberlands Limited Partnership
- The Teal-Jones Group
- Watchmen Forest Products Ltd.

A survey of wages or salaries by industry for Haida Gwaii is not available but the province-wide averages by industry provide general information on the scale of the gap in employment income between industries. The average weekly earnings in the BC logging industry in 2017 was estimated by Statistics Canada as $1,225.50 whereas the average weekly earnings in the accommodations and food services sector was much lower, $395.19.[41] A wide variety of enterprises operate within the tourism sector so the range of employment incomes varies widely by enterprise type and geographic location but the low level of unionization and higher levels of seasonal work mean that tourism sector employment incomes (including those in the resort lodge industry) are lower compared to incomes in the forestry sector.

Although direct employment in the Haida Gwaii forest sector has slipped in recent years, this sector remains a considerably stronger generator of employment than the transport, construction and retail sectors of Haida Gwaii. The indirect and induced employment generated by the direct economic activity[42] of the logging (1.42 indirect + induced jobs per 1 direct job) and wood products manufacturing (1.45) sectors of Haida Gwaii is estimated to be much higher than that of tourism (1.16) and slightly higher than that of the public sector (1.32). The indirect and induced employment associated with each direct logging industry job is estimated to be three times greater than that associated with each direct tourism sector job. Table 3-8 lists indirect and combined indirect and induced multipliers by economic sector for Haida Gwaii.[43]

[41] Statistics Canada. Table 14-10-0204-01 Average weekly earnings by industry annual.

[42] The local employment supported by spending of firms and their employees.

[43] Although the shown indirect and induced employment multipliers were calculated using 2006 data, these multipliers are relevant today because the characteristics of the Haida Gwaii business establishments remain largely the same today as in 2006. For example, a new type of and/or large-scale wood processing facility is not now present on Haida Gwaii, i.e. the types of Haida Gwaii wood processing facilities today are broadly similar in scale and technology as in 2006.

Table 3-8: Haida Gwaii employment multipliers, 2006

Industry	Indirect Multiplier	Indirect/ Induced[44] Multiplier
Logging	1.19	1.42
Wood products manufacturing	1.28	1.45
Construction	1.25	1.43
Public Sector	1.14	1.32
Tourism	1.05	1.16

Source: Horne 2009a

Small, interconnected economy

In relative terms, Haida Gwaii's economy is small. Only Haida Gwaii's forest and tourism sector's stand out within a provincial economy context; the islands have very modest levels of economic activity in other sectors, whether in other resource development areas, such as commercial fish and seafood harvesting , or in technology development or service sectors, such as higher education and health care. The small population of approximately 4,200 year-round residents and remoteness as islands separated from mainland BC by Hecate Strait provides a small base of year-round consumers that can support only a small service sector.

And even within the BC context, the primary drivers of the Haida Gwaii forest and tourism sectors are important yet still modest in size. The maximum potential timber harvest on Haida Gwaii as represented by the management unit AAC total of of 929,000 m^3 amounts to 6.2% of the coastal BC AAC (and 1.4%% of the overall BC AAC).[45] The context story is similar for fishing tourism based employment. A 2003 study reported the number of fishing lodges on Haida Gwaii as 18, a couple more than the 16 fishing lodges reported by BC MFLNR for 2018 (GS Gislason & Associates 2003); BC MFLNR 2018). In the 2003 study, the Haida Gwaii fishing lodge employment was estimated as 520 jobs and 245 PYs of employment.[46] Based on data reported in a 2007 study of BC's ocean economic sectors, direct employment in BC supported by tourism spending to undertake saltwater angling annually averaged approximately 2,168 PYs over the 2002-2005 period (GS Gislason & Associates et al 2007). In this context, Haida Gwaii's fishing lodge employment amounts to a little over 10% of BC's tourism-based saltwater angling direct employment.

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[44] Assumes out-migration in the event of lay-offs

[45] The total of Coastal BC AACs for TSAs and TFLs in 2017 was 14,878,739 m^3 and the total of BC AACs for TSAs and TFLs was 64,181,421 m^3, see https://www2.gov.bc.ca/gov/content/industry/forestry/managing-our-forest-resources/timber-supply-review-and-allowable-annual-cut

[46] The majority of Haida Gwaii fishing lodge workers are full-time seasonal employees, such as dockworkers, housekeeping staff, guides and chefs, who work on-site for a 4-5 month season. The total number of seasonal on-site jobs was estimated at 425 in this study. The year-round positions in head office administration, marketing and management was estimated as totaling 95, and that about 15% of the year-round employees worked part-time.

The oft reported employment and GDP data and indicators are typically reported by direct industries or sectors, and this does not convey the level of connectedness and even dependencies between sectors. The many suppliers that the various forestry enterprises tap into for goods and services are often the same suppliers that tourism facilities utilize and as well the suppliers to forestry and tourism enterprises overlap with many of the suppliers patronized by local households. These suppliers include building supply and hardware outlets, tire stores, fuel suppliers, electrical contractors, etc. This economic interconnectedness, which is heightened in a small and remote economy, means that the shifting economic tides simultaneously affect "all boats sharing the same waters". The wellbeing of the main drivers of the Haida Gwaii tourism sector is important to Haida Gwaii forest sector enterprises and vice versa because both sectors must perform reasonably well to drive a local level of spending on goods and services that can financially help sustain the service sectors of the islands.

In a metropolitan area, this interconnectedness is also present but much less vital to the wellbeing of the overall metropolitan economy. Within the Haida Gwaii context, sustaining a reasonably vibrant local service sector is important, not only to keep costs down through avoiding the financial and time costs of sourcing off islands, but also to help retain Haida Gwaii residents and attract new ones by having basic services on the islands that contribute to an attractive quality of life.

Income levels are below the province-wide level

Excepting for Village of Queen Charlotte, the median (before tax) household incomes in Haida Gwaii communities sat well below the BC median household income level in both 2005 and 2015. In 2015, Queen Charlotte residents had the highest median household income on Haida Gwaii at $69,120 and residents of the Haida community of Old Massett had the lowest at $30,208. The median household income for the province in 2015 was $69,995.

In general, lower income persons are at higher risk of poorer health outcomes as there is less money available for quality housing, nutritious food, accessible recreation activities, and other elements (Public Health Agency of Canada 2013). The Low Income Measure (LIM)[47] was used to assess the prevalence of low incomes on Haida Gwaii (i.e. proportion of the residents of Haida Gwaii communities who are considered as living in low income households). Based on the Low Income Measure, Queen Charlotte (15.1%) and Port Clements (12.3%) had proportionately fewer low income residents compared to the province-wide level of 15.5%. Masset, Electoral Area D (Graham Island) and Electoral Area E (Moresby Island) had higher levels of the prevalence of low income residents by comparison to the province-wide yardstick. Data for Haida communities were not available for this measure of low income.

[47] The indicator shows the percentage (i.e. prevalence or proportion) of low income persons in a community. Low income is based on the low income measure (LIM), which is a dollar threshold that delineates low-income in relation to median income after tax. The LIM is 50% of median adjusted economic family income, where "adjusted" indicates that family needs are taken into account.

Table 3-9 presents data on median household incomes and prevalence of low incomes for several Haida Gwaii communities and BC.

Table 3-9: Median household income, 2005 and 2015, and Prevalence of Low Incomes, 2015

	Queen Charlotte	Masset	Port Clements	Skidegate	Old Massett	Electoral Area D (Graham Island)	Electoral Area E (Moresby Island)	BC
Median household income (2015)	$69,120	$59,968	$58,120	$48,612	$30,208	$63,424	$52,480	$69,995
Median household income (2005)	$51,117	$42,845	$48,255	$35,541	$28,256	$40,112	$43,190	$52,709
% increase, 2015 median income over 2005 level	35.2%	40.0%	20.4%	36.8%	6.9%	58.1%	21.5%	32.8%
Prevalence of low incomes (2015)	15.1%	19.5%	12.3%	NA	NA	19.6%	16.9%	15.5%

Source: Source: Statistics Canada 2015 and 2018; and author's calculations

4 Situation Analysis - Haida Gwaii Forestry Sector

4.1 Introduction

The basic economic activity that underpins the overall performance of the Haida Gwaii forestry sector is on-islands timber harvesting. Therefore, changes in the overall Haida Gwaii timber harvest, along with changes in the harvest by species and age category flow through to changes in other key economic variables, including but not limited to employment and employment income, purchases of goods and services at suppliers, and forest company and BC government revenues.

Three factors have had the greatest influence on the timber harvesting performance of the Haida Gwaii forestry sector, two factors on the timber supply side and one factor on the timber demand side. In regard to the latter, over the past few decades, the demand for western redcedar-based wood products in the very large US house building and home renovation markets has been especially important for the Haida Gwaii forest sector. Demand for whitewoods-based commodity products, including logs, in China and some other very large international markets are important too but western redcedar product demand has been the main driver of the fortunes of the Haida Gwaii forest sector over the past decade.

On the supply side, a primary influence on timber harvesting levels has been the regulated AACs for the Haida Gwaii Management Area and the Haida Gwaii TSA and TFLs, which have set the upper limits on the potential total timber harvest in these Haida Gwaii timber harvesting management units. The other very important supply side factor has been the commercially operable volume of Old Growth western redcedar on the Haida Gwaii Timber Harvesting Landbase and private lands. This factor is directly tied to the cost of timber harvesting and transport on Haida Gwaii.

The intersection of the regulated Haida Gwaii timber supply AACs and the commercially operable western redcedar volumes with the demand for Haida Gwaii timber has driven Haida Gwaii timber harvesting volumes, which has fed through to effects on Haida Gwaii forest sector employment and employment income, log prices, sales revenues and stumpage and goods and services purchasing activity. Shifts in one or more of the three cited key supply and demand factors soon result in distinct economic effects in the Haida Gwaii forest sector and the overall Haida Gwaii economy.

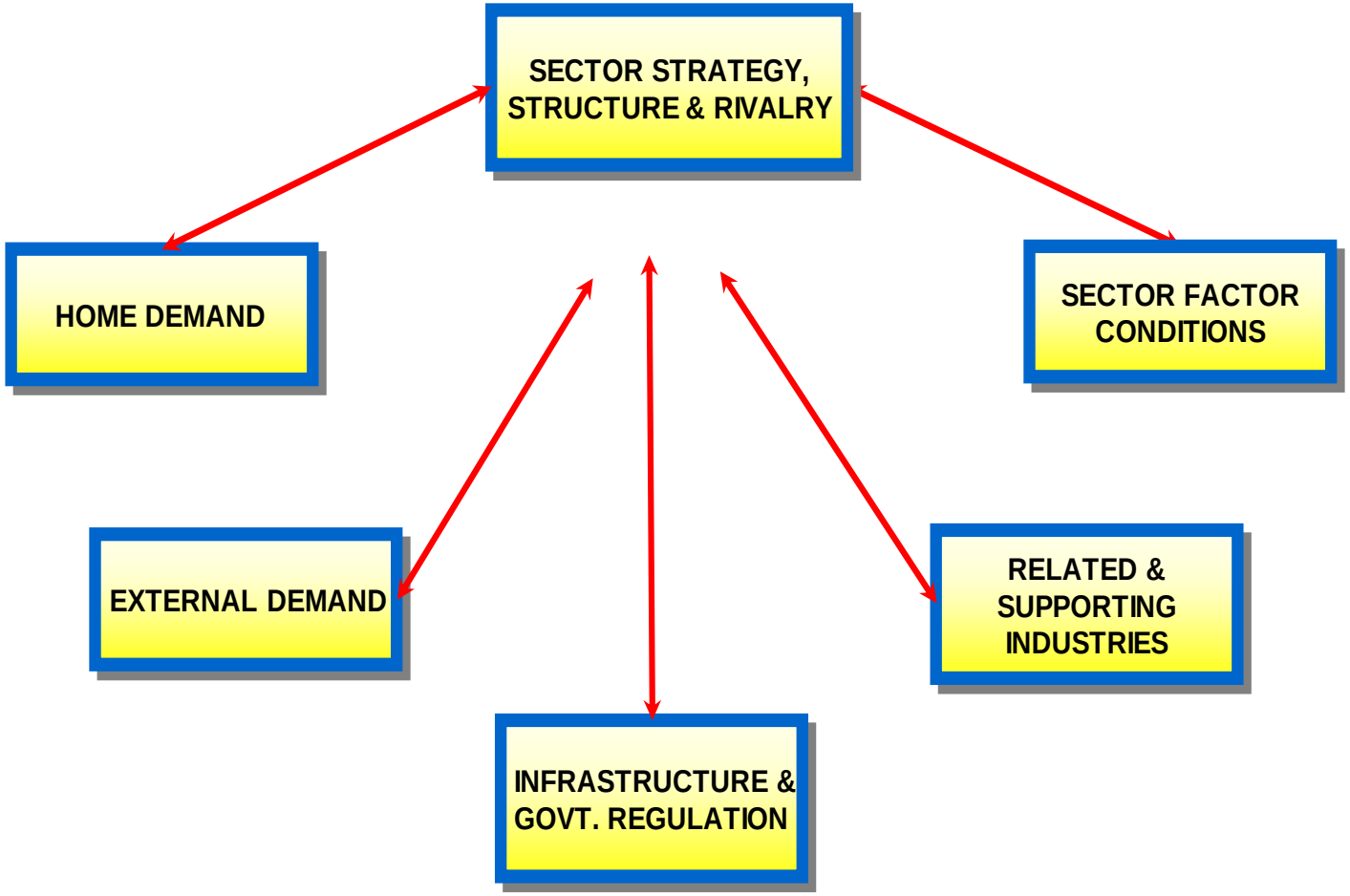
Several other supply and demand factors (both internal and external to Haida Gwaii) have important push and pull effects on the Haida Gwaii forest sector and economy, including but not limited to the following.

- Availability and cost of wood processing on Haida Gwaii (as well as in relation to wood processing availability and cost in other jurisdictions)
- Countervail duties and trade agreements

- Changes in other wood product demand factors, such as rising incomes in China
- Changes in non-Haida Gwaii timber supply factors, such as a prohibition on logging in natural forests in China
- Development and marketing of alternative products to western red cedar-based products, such as wood composites for decking materials
- Haida Gwaii marine transport infrastructure
- Haida Gwaii LUOO
- BC MFLNR and BCTS timber supply regulation and administration practices, such as TSL planning, roadbuilding and competitive auctions, Haida Gwaii log export exemption OIC and cutting permit issuance
- Haida Gwaii labour force availability and qualities
- Silviculture policies, strategies and practices on Haida Gwaii
- Monetization of forest carbon storage

The situation analysis undertaken for this socio-economic report was structured to examine the Haida Gwaii forest sector within six factors that underlie its long-term socio-economic viability: home demand for its wood products, external demand for its wood products, infrastructure and government regulation (such as AAC determinations and log export regulation), related and supporting industries that support ongoing operations, sector factor conditions and the strategy, structure and rivalry (between forestry enterprises) of the sector. The situation analysis framework is summarized in Figure 4-1. This framework is used in the summary and conclusions section (4.12) to lay out in a graphic figure the current status of the Haida Gwaii forest sector.

Figure 4-1: Situation analysis framework



In the following sections, current and historic Haida Gwaii conditions of each of the dimensions of the Haida Gwaii forest sector are presented.

4.2 Home (Haida Gwaii and BC) Demand

A very long cultural tradition of utilizing cedar fibre in a wide range of applications has been present on Haida Gwaii and this source of local demand for cedar fibre is being responded to through the Cultural Wood Access program[48] and other on-islands sources.

The local demand in total for lumber products is modest however because of the small population of the islands, approximately 4,200 in 2016. In broad terms, the local demand for lumber can be estimated by reference to the Canadian per capita consumption of lumber products, which was an estimated 0.68 m^3 per capita in 2017.[49] Using this parameter as a basis for helping to estimate Haida Gwaii lumber consumption then Haida Gwaii lumber product consumption in 2017 totalled approximately 2,900 m^3. The Haida Gwaii level was likely somewhat higher than this figure because of the local traditions for incorporating visual wood features into new building construction and renovations and some of the local specialized demand coming through Gwaii Haanas and BC Parks, Haida and municipal offices for boardwalks and community buildings, and the fishing resorts but the local demand for lumber products is nevertheless relatively small compared to the local harvest timber volume (see Section 4.6.1).

Demand from local parties, such as local resorts, for mainly non-structural appearance quality cedar wood products are largely satisfied by approximately 10 micro mills and an unknown number of backyard log cutting units on Haida Gwaii. They mainly focus on filling custom cut orders and making lumber products for local customers. The local micro mills are described in Section 4.9.7. The remoteness of Haida Gwaii and the associated transport cost to ship lumber products from other areas of BC to the islands act as a protective cost barrier for local wood product makers.

Even within the province, the BC forest sector is highly dependent on sales to outside of the province. Figure 4-2 shows the annual levels, and the 2008-2017 decade trend, for total sales of all wood products manufactured in the province versus value of exports of BC manufactured wood products. Over the 2008-2017 period, BC wood product exports accounted for 79-87% of BC wood product sales. This chart understates the relative importance of outside BC sales of BC forest products as it incorporates neither sales to other areas of Canada nor export log sales.

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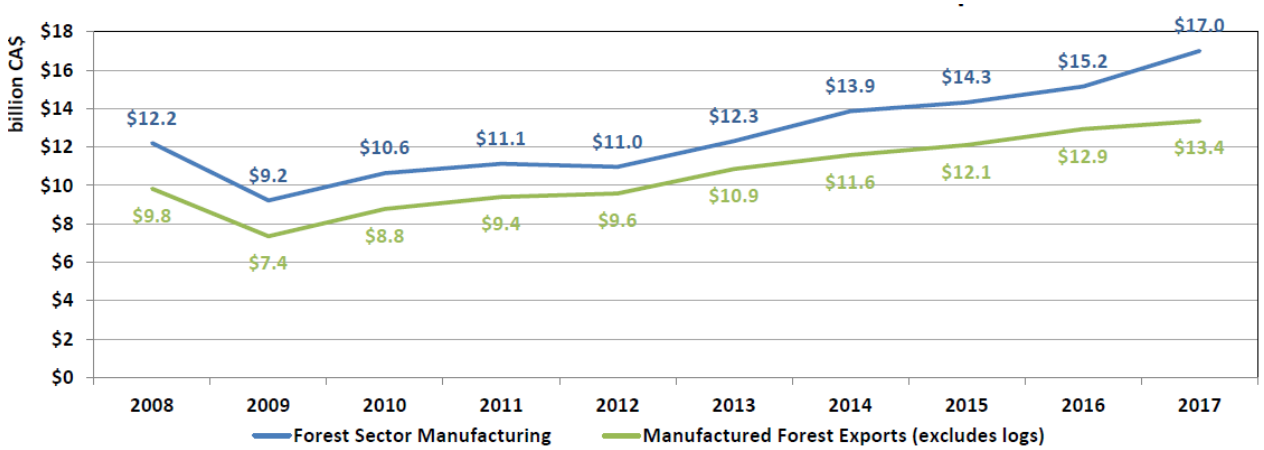
[48] See http://www.haidanation.ca/?page_id=48

[49] Calculated from lumber shipment, import and export and population data.

Figure 4-2: BC wood product sales compared to BC exports of wood products (excluding logs) ($B), 2008-2017



Source: BC MFLNR 2018e

4.3 External Demand

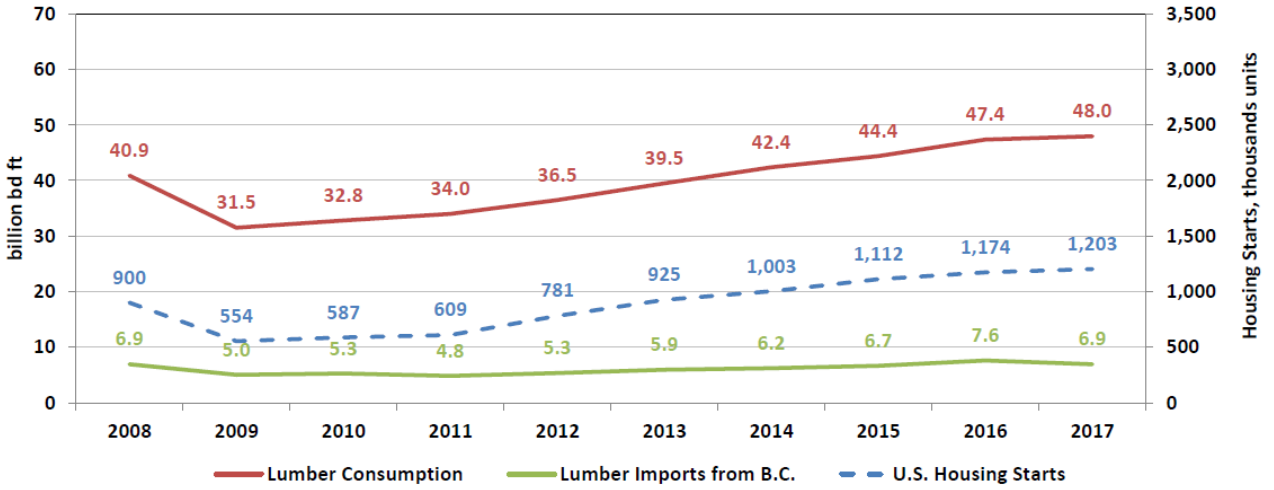
4.3.1 Introduction

Demand for wood products in external markets drives Haida Gwaii forest sector economic activities

External market demand for softwoods products (including logs) that matches with the Haida Gwaii log supply profile is a critical factor pushing forward Haida Gwaii forest sector economic activities. Demand conditions in two markets drive the overall commercial harvest on HGMA lands. The key longstanding market factor is US housing market demand for cedar products and the newer market factor is the demand in China for whitewood logs for input into the manufacture of lower value structural wood products, such as cement form materials.

Trends in the US housing markets are the main factor that feeds back into the demand for cedar timber harvested on Haida Gwaii. About 75% of BC cedar lumber exports are directed to the US, 95% of cedar siding exports go to the US and 95% of cedar shake and shingle exports are US-bound (Gregory, McBeath and Filipescu 2018). The following chart shows the tight relationship or correlation between the 10-year 2008-2017 trend in the volume of US imports of BC lumber products and the US housing starts trend. The shown 2008-09 downtick in US lumber imports from BC corresponded with the downturn in the US housing market and the 2017 downtick in US lumber imports from BC corresponded with the expiry of the Softwood Lumber Agreement (SLA) and the imposition of temporary countervail duties. The figure also shows the US housing market recovering from the 2008-09 trough levels and the transition from a supply driven to a demand driven lumber market that resulted in improved pricing for wood products, including logs (See Section 4.3.2).

Figure 4-3: Trend in US imports of BC lumber products compared to trend in US housing starts



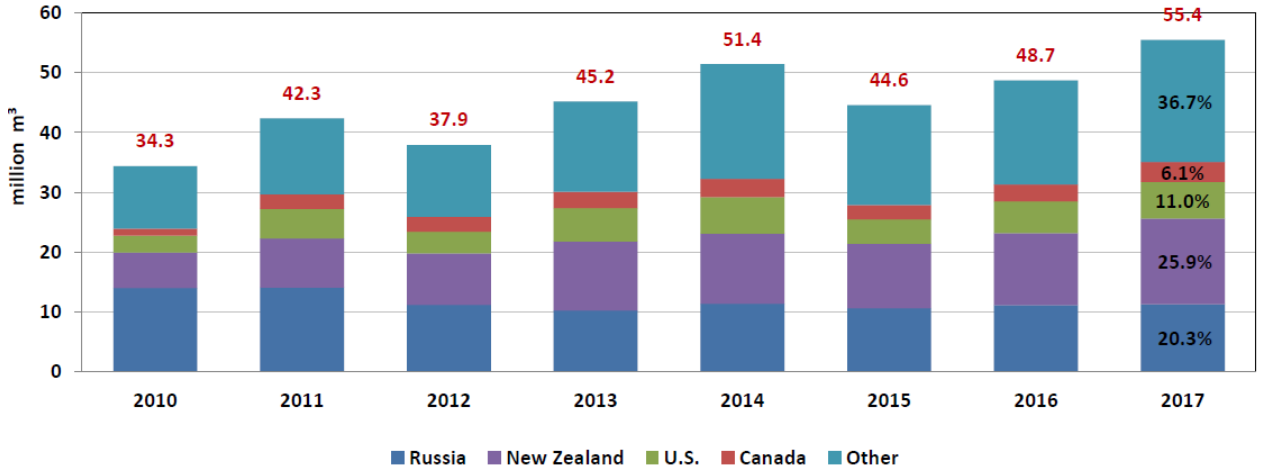
Source: Source: BC MFLNR 2018e (data sourced from Western Wood Products Association and US Census Bureau)

Western Forest Products (WFP) manufactures the largest volume of cedar products on Coastal BC and is a public company that is followed by investment analysts. The following quote from a well-known forest industry analyst captures the fundamental linkage between WFP's overall financial success and WFP's success in selling cedar products into the US (and WFP's access to the US market). "We had previously upgraded Western FP on June 5, 2017 when the shares were trading at $2.17 due to the company's positioning on the trade file in a strong cedar market, attractive valuation and upside to a potential new quota-based SLA (which could result in structurally higher margins for WFP)…." (Patel 2017). This quote also communicates the substantive importance of the lumber product (including cedar products) trading arrangements between the US and Canada, which are currently based on short-term countervail duties.

China imported record high volumes of softwood logs and lumber in 2017 and is now the world's largest log importer and the second largest lumber importer. Over the recent decade, China's log imports are up by approximately 75%. The Canadian share of China log imports (which is essentially completely sourced from BC forests) has stayed within a narrow band for several years and stood at 6.1% in 2017. In recent years, New Zealand and its fast growing plantations have been China's largest log supplier with a 25.9% market share in 2017, followed by Russia with a 20.3% share.

The driving forces behind the upward trend in China's softwoods log demand is two-fold; a deficit of domestic timber requires China to rely on imports and increased urbanization and associated increased wealth have increased demand for structural lumber products. Between 2010 and 2025, 300 million Chinese people are projected to move from rural to urban areas with attendant new residential demand (WFP 2018). Figure 4-4 shows the trend in Chinese log imports by supplier country.

Figure 4-4: Chinese log imports by supplier country (million m³), 2010-2017



Source: BC MFLNR 2018e (data sourced from Wood Markets China Bulletin)

4.3.2 Vancouver Log Market Prices

Introduction

Shifts in harvesting volume on Haida Gwaii can be due, as previously mentioned, to AAC changes, but also due to:

- seasonal weather conditions, i.e. less harvesting in winter and early spring months
- a shift in a sizeable cost driver, such as a labour cost increase,
- but the primary driving factor in harvesting activity shifts is due to shifts in BC log marketplace prices.[50]

In part, the relative importance of BC log prices on harvesting activity is due to the regulation of log exports outlined in Section 4.5.2.

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[50] However the scope of the shift in harvest volume, i.e. the supply of Coastal BC (and Haida Gwaii) logs into the various log marketplaces, is linked to the concept of price elasticity, both own-price elasticity of supply and cross-price elasticity. The most recent elasticity of supply study for Coastal BC logs concluded that Coastal BC logs are price inelastic (in the short-run and the long-run) (Sun, Niquidet and Clapper 2015). However, the researchers also concluded that elasticities of supply are higher in remote districts, where the logging cost is higher and manufacturing facilities are fewer. Essentially, this researcher's results indicate that shifts in Coastal BC log prices result in relatively modest shifts in timber harvests (log supply). Price inelasticity points to buyers being relatively unresponsive to log price increases or decreases. The inelastic price for Coastal BC logs (and by inference Haida Gwaii logs) is due to two factors: slow growth of the Coastal BC timber "crop" (new supply comes on stream very slowly), harvest volume regulatory limits (i.e. AAC limits which means log supply shifts are capped in the short and long run) A caveat is that only a limited amount of research has been undertaken on price elasticity of supply for Coastal BC logs and almost no research for logs by species, such as western redcedar, and also no research on cross-price elasticity. A recent study of the BC cedar industry recommended that research be undertaken on cross-price elasticity of cedar products (Gregory, McBeath and Filipescu 2018).

The log prices in turn reflect demand conditions for the wood-based end use products that incorporate the logs extracted from coastal BC forests. In this section, the recent history of log and wood product prices that directly help drive shifts in timber harvesting on Haida Gwaii are considered.

In BC, the functioning log marketplace is organized on a coast-wide basis. Implementation of the BC Government's Forest Revitalization Plan starting in 2003 reinforced this coast-wide marketplace, which facilitates price and quality competition for Haida Gwaii timber along with the timber of other coastal TSAs, TFLs and private lands. [51]

Transactions of logs between non-related, Coastal BC-based forest industry parties, such as between a market logger and a wood processing facility, occur within the Vancouver Log Market (VLM), which is a longstanding but informal institution that does not have a centrally organized administrative structure. The selling, buying and trading of logs between entities occurs throughout coastal BC, including Haida Gwaii, but log prices are typically adjusted as necessary to reflect transport costs to the Howe Sound-Fraser River area. The collection and publication of Vancouver Log Market prices and volumes are currently undertaken by the Timber Pricing Branch of the BC MFLNR. Every month, the Timber Pricing Branch asks Coastal BC-based forest industry parties, including parties operating on Haida Gwaii, to report their log trading volumes and prices and then collates, adjusts and reports the collected price data as Vancouver Log Market data and makes the reports available on a website.[52]

Rising Vancouver Log Market prices reflect strong lumber market demand conditions in the US house building and home renovation markets

The annual average price of western redcedar (Old Growth) logs, taking into consideration all log grades, climbed from a low of $101 in 2009 to $233 in 2017, a more than doubling of the average price in 2009 when demand conditions in the US housing market were at a low ebb because of the 2008 financial crisis.

Trends in the US housing market are the main factor that feeds back into the demand for Haida Gwaii cedar timber. In BC. about 75% of the province's cedar lumber exports are directed to the US, 95% of its cedar siding exports go to the US and 95% of cedar shake and shingle exports are US-bound (Gregory, McBeath and Filipescu 2018). Export value and volumes of red cedar lumber, the main cedar product category, mirror the trend in Vancouver Log Market prices.

Hemlock log prices were largely stagnant over the 2008-2017 and well below Haida Gwaii per m^3 harvest and transport costs. Prices for Sitka spruce logs have been relatively strong (taking

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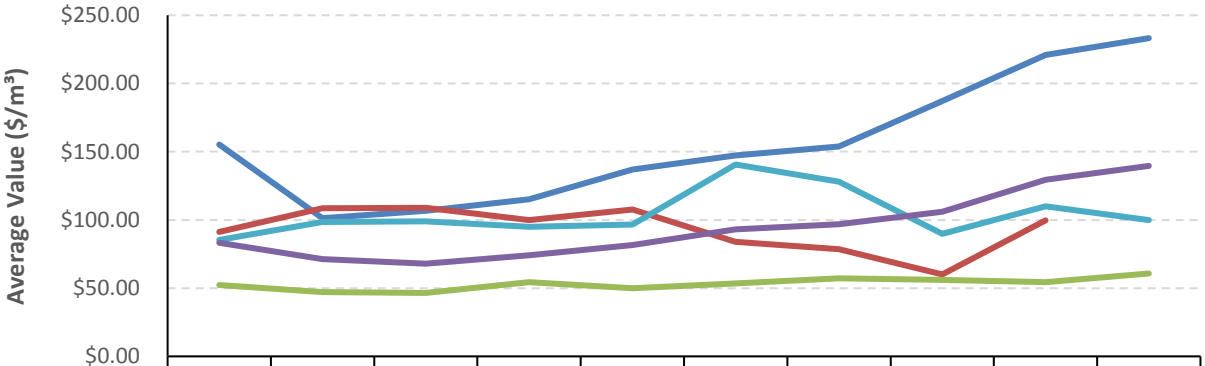
[51] Reinforcement because the greater distance from Lower Mainland and Vancouver Island fibre processing capacity, remote harvesting locations and somewhat harsher growing climate already places Haida Gwaii logs at a cost disadvantage and sometimes at a quality disadvantage.

[52] See https://www2.gov.bc.ca/gov/content/industry/forestry/competitive-forest-industry/timber-pricing/coast-timber-pricing/coast-log-market-reports

into consideration all log grades), peaking at about $140/m^3$ in 2013. These log price trends largely reflect conditions in key log and wood product markets and demonstrate that commercial viability of timber harvesting on Haida Gwaii is substantively determined by the amount of cedar and/or spruce in stands. Figure 4-5 and Figure 4-6 show the recent trends in Old Growth and Second Growth log prices, respectively, on the VLM.

Figure 4-5: Old Growth Log Average Price by Species ($/m³)[53], Vancouver Log Market, 2008-2017

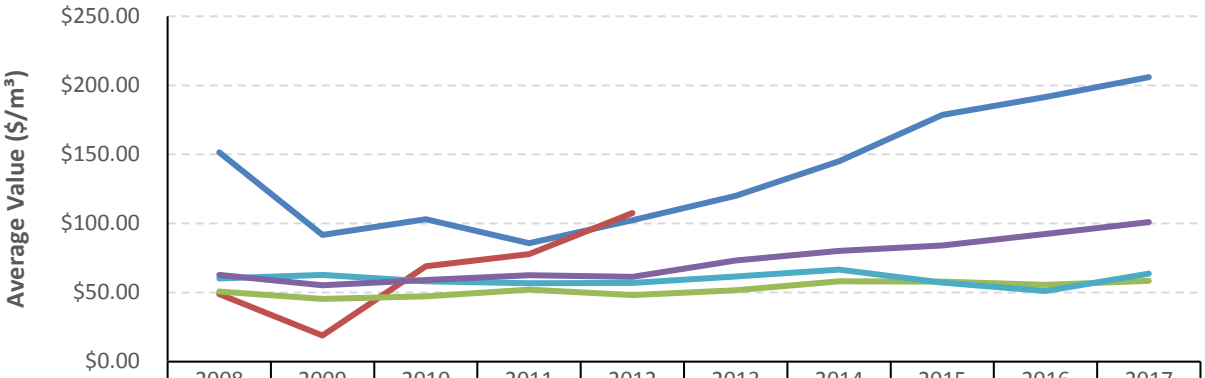


	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Cedar	$155.28	$101.29	$106.69	$115.23	$137.00	$147.23	$153.91	$187.26	$220.98	$233.21
Cypress	$91.33	$108.65	$108.89	$99.91	$107.64	$83.83	$78.44	$60.07	$99.60	
Hemlock	$52.24	$47.21	$46.49	$54.48	$50.00	$53.38	$57.10	$55.94	$54.28	$60.75
Spruce	$85.35	$98.48	$99.02	$95.02	$96.66	$140.62	$127.95	$89.82	$109.89	$99.94
All	$83.34	$71.19	$67.94	$74.00	$81.50	$92.99	$96.76	$106.01	$129.54	$139.58

Source: Timber Pricing Branch BC MFLNR 2018 and author's calculations

[53] All dollar amounts in this report are reported in current Canadian dollars unless otherwise noted.

Figure 4-6: Second Growth Log Average Price by Species ($/m³), Vancouver Log Market, 2008-2017



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Cedar	$151.38	$91.80	$103.10	$85.73	$102.48	$120.02	$144.99	$178.62	$191.57	$205.92
Cypress	$48.85	$18.91	$69.09	$77.75	$107.55					
Hemlock	$50.74	$45.41	$47.26	$52.21	$48.08	$51.67	$58.05	$57.89	$55.49	$58.48
Spruce	$60.18	$62.74	$58.25	$56.79	$57.05	$61.69	$66.61	$57.10	$51.11	$63.78
All	$62.66	$55.29	$59.16	$62.50	$61.32	$73.16	$80.08	$84.15	$92.45	$100.98

Source: Timber Pricing Branch BC MFLNR 2018 and author's calculations

Generally, average prices for Second Growth western redcedar and spruce logs in the Vancouver Log Market trailed their Old Growth log prices over the 2008-2017 period

The gap between the average prices for Second Growth and Old Growth western redcedar logs was relatively modest over the 2008-2017 decade, which suggests that the transition to a greater share of Second Growth cedar will be financially viable on a per m³ basis. Second Growth VLM log prices as a percentage of Old Growth VLM Log Prices are shown in Table 4-1.

Average prices for Second Growth and Old Growth hemlock logs were similar over this decade.

Unlike cedar and hemlock, the price gap between Second Growth and Old Growth Sitka spruce logs was especially wide (approximately 30 to 56 percentage points) during the 2008-2017 period. shows Second Growth average log prices as a percentage of Old Growth average log prices in the Vancouver Log Market.

Table 4-1: Second Growth VLM log prices as percentage of Old Growth VLM Log Prices, 2008-2017

	Red Cedar	Hemlock	Spruce
2008	97.5%	97.1%	70.5%
2009	90.6%	96.2%	63.7%
2010	96.6%	101.7%	58.8%
2011	74.4%	95.8%	59.8%
2012	74.8%	96.2%	59.0%
2013	81.5%	96.8%	43.9%
2014	94.2%	101.7%	52.1%
2015	95.4%	103.5%	63.6%

2016	86.7%	102.2%	46.5%
2017	88.3%	96.3%	63.8%

Source: Timber Pricing Branch BC MFLNR 2018 and author's calculations

4.3.3 Export Log Market Prices

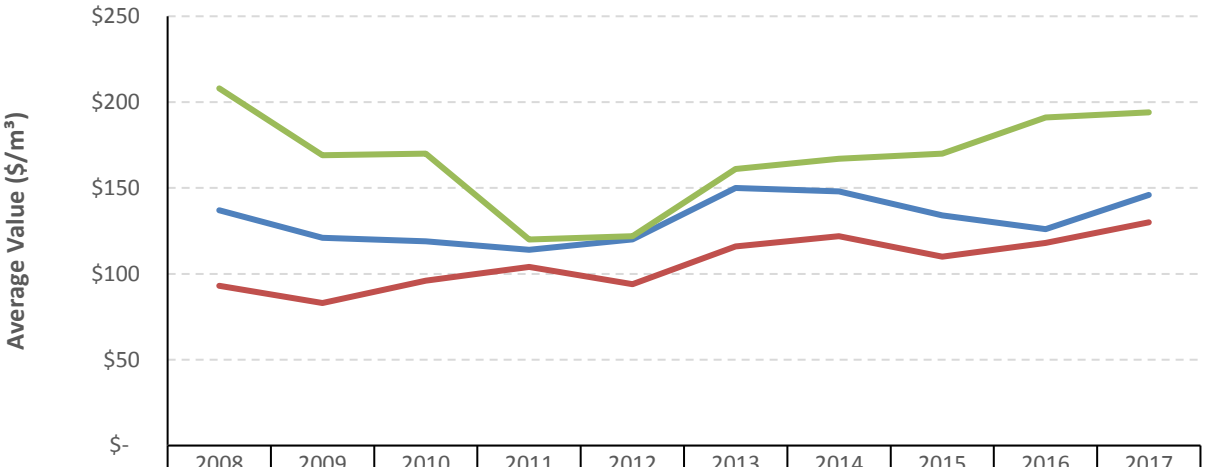
Rising softwood log prices has been the trend in export markets post the 2008 global financial crisis

As outlined in Section 4.6.4, Haida Gwaii timber destined for export has formed a substantial and increasing portion of the total Haida Gwaii harvest over the 2008-2017 decade. The BC-based supply side factors contributing to the increase in Haida Gwaii log exports are reviewed in Section 4.5.2. The demand side factors driving the growth in log exports are the demand for wood-based end products in the country markets sourcing BC logs, mainly China, Japan, South Korea and the US.

Export log prices, driven by wood product demand conditions in China (hemlock), Japan (spruce) and the US (western redcedar), have generally exceeded VLM log prices

Another important factor has been the high prices for export logs relative to Vancouver Log Market prices, especially for hemlock logs, which rose from a low of $83/m^3$ in 2009 to $130/m^3$ in 2017. Prices for export spruce logs, which also benefited from the 2010 Haida Gwaii Timber Exemption Order, dipped for a few years post the global financial crisis that began in 2008 but recovered by 2013, a pattern seen across the three main Haida Gwaii export log species. Table 4-9 shows the recent trend in and levels of average annual prices of BC export logs by species that are sourced from Haida Gwaii.

Figure 4-7: BC Export Log Average Price by Species ($/m³), 2008-2017



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Spruce	$137	$121	$119	$114	$120	$150	$148	$134	$126	$146
Hemlock	$93	$83	$96	$104	$94	$116	$122	$110	$118	$130
Cedar	$208	$169	$170	$120	$122	$161	$167	$170	$191	$194

Source: BC Stats and author's calculations

The higher prices in export markets for hemlock and spruce logs than their prices in the Vancouver Log Market have been a key factor in the diversion of an increasing portion of the Haida Gwaii log harvest from domestic markets over to buyers in China, Japan and South Korea.

Over the 2008-2017 period, the average export price for hemlock logs ranged between 176% and 217% greater than the average VLM prices for Old Growth hemlock logs and between 183% and 225% greater than the average VLM prices for Second Growth hemlock logs. The average export price for spruce logs also superceded the VLM prices for Old Growth and Second Growth spruce logs by a considerable margin.

The margin between export prices and VLM prices for western redcedar logs showed a different pattern over the 2008-2017 decade. The gap between the export prices and the VLM prices for cedar logs narrowed after 2010 whereas the margin between export and VLM prices was wider to start with and grew for hemlock and spruce logs over the decade. The differences between these three species in the gap between their export and VLM prices are due to the following reasons.

- The improved strength of the US residential building and renovation markets post 2010 pushed up the demand (and prices) in the US for cedar products within a limited cedar log supply situation.
- The willingness of these US residential building and renovation markets to accept a price premium for the value of the visual and durability attributes of cedar products.

- The more limited demand in Asian markets for cedar wood products compared to North America and the direct competition from tropical hardwoods in Asian markets.

Table 4-2 presents average export log prices as a percentage of average Vancouver Log Market prices by species for Old Growth and Second Growth logs.

Table 4-2: Export Log Prices as Percentage of Vancouver Log Market Prices by Species for Old Growth and Second Growth logs, 2008-2017

	Old Growth Red Cedar	Old Growth Hemlock	Old Growth Spruce	Second Growth Red Cedar	Second Growth Hemlock	Second Growth Spruce
2008	134%	178%	161%	137%	183%	228%
2009	167%	176%	123%	184%	183%	193%
2010	159%	206%	120%	165%	203%	204%
2011	104%	191%	120%	140%	199%	201%
2012	89%	188%	124%	119%	196%	210%
2013	109%	217%	107%	134%	225%	243%
2014	109%	214%	116%	115%	210%	222%
2015	91%	197%	149%	95%	190%	235%
2016	86%	217%	115%	100%	213%	247%
2017	83%	214%	146%	94%	222%	229%

Source: BC MFLNR 2018; BC MFLNR 2018; and author's calculations

4.4 Haida Gwaii Commercial Harvest Timber Supply

4.4.1 Haida Gwaii Management Area Annual Allowable Cut

From an economic perspective, the HGMCdetermined AAC sets a maximum allowed annual timber harvesting level for HGMA lands

This chapter begins with a review of the regulated allowable annual cut (AAC) levels and AAC management on Haida Gwaii as they place an upper boundary on annual timber supply volume from HGMA lands that can be directed into local, other BC and international log markets and wood processing facilities. Regulatory decisionmaking for setting AAC levels on Haida Gwaii generally incorporates but is not limited to:

- a timber supply analysis and its inputs of available harvesting landbase, inventory and growth and yield data,
- planning or legal designations, such as those provided for under the *Land Act*, the *Forest and Range Practices Act* (FRPA) and the Haida Gwaii Land Use Objectives Order, and
- information on local social and economic conditions.

The HGMC's AAC determination sets the overall upper limit for the sum of AACs applicable to HGMA lands of five types of forestry management units. The forestry management units are as follows.

- TSA (excepting the portion of a TSA situated in a municipality)
- TFL (excepting the portion of a TSA situated in a municipality)
- woodlot licences (excepting the private lands portion)
- community forest agreements[54]
- First Nations woodland tenures

Section 8(11) of the *Forest Act* prescribes that the aggregate of AACs for the management units situated within the HGMA boundaries cannot exceed the HGMA's AAC. The forested land management units currently present in the HGMA are as follows.

- TSA 25 (Haida Gwaii)
- TFL 58
- TFL 60
- Woodlot Licences W1841, W1840, W0162 and W0161

The current AAC for the Haida Gwaii Management Area (HGMA) is 929,000 m^3 and was determined by the Haida Gwaii Management Council (HGMC) and became effective as of April 4, 2012 (HGMC 2012).

The areas of the management units not in the HGMA (and the estimated annual AAC contribution from each), i.e. the municipal areas in TSA 25 (7,500 m^3) and TFL 60 (2,000 m^3) and the private lands in Woodlot Licences W1841, W1840, W0162 and W0161 (1,817 m^3), were not included in the determination of the HGMA AAC by the HGMC (Sutherland 2012). 921,550 m^3 is the aggregate of the AACs for TSA 25, TFL, 58 and TFL 60 and 7,450 m^3 is the aggregate of the AACs for the four woodlot licences that the HGMC used in its HGMA determination of 929,000 m^3.

From an economic perspective, the HGMA AAC sets a maximum allowed (and maximum potential) annual timber harvesting level on HGMA lands that is then Provincially regulated over a cut control period and therefore places an upper boundary on log supply (from HGMA lands) into local, other BC and international log buying and wood processing markets. The AAC therefore sets out a potential timber harvest and supply of logs from HGMA lands, which takes into account regulatory requirements and policy guidance, including ecosystem-based management (EBM), and assumptions about commercial

[54] Neither a First Nations woodland tenure nor a community forest agreement is in place in the HGMA although establishment of both tenures in the HGMA are the focus of ongoing proposals and discussions (see Sections 4.4.4 and 4.4.5, respectively).

operability of logging activities. The actual harvest is determined in broad terms however by the following.

- Log and wood product demand forces in key markets such as the US and China.
- Other timber supply considerations, mainly the cost of harvesting and transporting timber on Haida Gwaii and the match of available Haida Gwaii timber with market demands.
- Winter and summer weather conditions.
- Political protests at or near current or prospective cut blocks.
- Administration- and policy-based decisions and actions on timber harvest plans and permits by entities holding Haida Gwaii timber tenures and by authorities with regulatory responsibilities for Haida Gwaii forests.[55]

As an initial observation, a modest decrease or increase in the HGMA AAC from the current level would not necessarily translate to changes in timber harvesting and associated economic activity because the full amount of AACs of management units around the province are often not utilized due to weak demand in key wood product markets, species focused partitions and/or administrative reasons, such as incomplete cut block planning. However, a larger decrease in the HGMA AAC (even within the context of weak log markets) or a modest increase in AAC when demand in key wood product markets is strong would likely result in substantive harvest level shifts from recent levels and associated changes in economic activity on Haida Gwaii.

The HGMC's April 2012 decision was the first time that non-ministry persons determined an AAC for BC public forest lands. This was also the first time that an AAC was developed for the public forested landbase on Haida Gwaii. Prior to the HGMC's 2012 determination, the Chief Forester of BC determined a separate AAC for each of the Haida Gwaii Timber Supply Area (TSA) and tree farm licenses (TFLs) and the Haida Gwaii Forest District manager provided an AAC for Haida Gwaii Woodlot Licences (WLs).

AACs in force prior to that decision for TSA 25, TFL 58 and TFL 60 and for the lands of the four Haida Gwaii woodlots need to be aggregated from the perspective of describing the maximum allowed harvest on HGMA lands prior to the HGMC's 2012 decision. The aggregated total of the AACs for these management units prior to the HGMC's 2012 decision was 1,780,092 m^3.[56] The 2012 determination of 929,000 m^3 represented a 47.8% reduction

[55] This would include decisions about availability of and use of Haida Gwaii contractors, labour supply and equipment and use of non-local workers and contractors.

[56] 1,772,616 m^3 for the sum of the TSA 25, TFL 58 and TFL 60 AACs and 7,476 m^3 attributable to Crown lands of the four woodlots (9,293 m^3 is the sum of the AACs for the four woodlots on Haida Gwaii, 1,817 m^3 is attributable to their private lands and 7,476 m^3 attributable to their Crown lands).

from this prior total allowed annual timber harvest (which had been in place since 2009, see Appendix III).

4.4.2 AACs of Haida Gwaii Forest District Management Units TSA 25, TFL 58 and TFL 60

Each of the 2012 Haida Gwaii TSA and TFL AAC determinations entailed significant decreases from the previous levels, ranging from -21.0% to -57.7%

Under Section 8 of the *Forest Act*, the Chief Forester determines AACs for TSAs and TFLs throughout BC, including TSA 25 and TFLs 58 and 60 on Haida Gwaii. Subsequent to the April 2012 determination of the initial AAC for the HGMA, the Chief Forester determined new AACs for TSA 25 (512,000 m^3), TFL 60 (79,000 m^3) and TFL 58 (340,000 m^3) effective September 20, 2012. These new AACs for the Haida Gwaii management units sum to a total of 931,000 m^3.

The new Haida Gwaii AACs reflected the requirement of Section 8(11) of the *Forest Act* that the aggregate of AACs for the TSA, TFLs, woodlot licences, community forest agreements, and First Nations woodland tenures applicable to the HGMA not exceed the HGMA's AAC. The 931,000 m^3 figure incorporates the estimated annual 9,500 m^3 contribution from the municipal land areas of TSA 25 and TSA 60.[57]

Each of the 2012 Haida Gwaii TSA and TFL AAC determinations entailed significant decreases from the previous levels, ranging from -21.0% to -57.7%. The September 2012 and prior AACs for these management units and the gap between them are presented in Table 4-3.

Table 4-3: Recent AACs for Haida Gwaii Management Units (m^3)

Management Unit	AAC effective September 20, 2012 (m^3)	Prior AAC (m^3), in effect since 2009	Change in AAC (m^3 and %)
TSA 25	512,000	869,748	-357,748 / -41.1
TFL 58	79,000	100,000	-21,000 / -21.0
TFL 60	340,000	802,868	-462,868 / -57.7[58]
All units	931,000	1,772,616	-841,616 / -47.5

[57] The non-municipal land areas of TSA 25, TSA 58 and TFL 60 accounted for a total AAC contribution of 921,500 m^3 (Sutherland 2012).

[58] The shape and area of TFL 60 changed significantly between the 2012 and previous AAC determination which, in part, is a contributor to the shrunken AAC.

Source: Sutherland 2012

Haida Gwaii-headquartered Taan Forest Products Ltd. is the holder of the TFL 60 tenure, which has an AAC of 340,000 m^3 and is predominantly located on Graham Island with smaller portions located on Moresby Island and on Louise Island. Taan completed the acquisition of the TFL 60 tenure (then called TFL 39 Block 6) from WFP in June 2012 (Taan Forest 2016).

TFL 58 is located on Moresby Island. Vancouver-headquartered A&A Trading (Haida Gwaii) Ltd. (A&A) is the holder of the TFL 58 tenure, which has an AAC of 79,000. A&A Trading completed the purchase of the TFL 58 tenure from Surrey-headquartered Teal Cedar Products Ltd. in December 2016.

Through their replaceable and non-replaceable forest licences in TSA 25, Haida Gwaii-headquartered Taan, Delta-headquartered Husby Forest Products Ltd. (Husby), and Vancouver-headquartered A&A, and BC Timber Sales through its apportionment, are the main holders of TSA 25 AAC committed volume. TSA 25 is predominantly located on the west and east sides of Graham Island with a small area on the northwestern portion of Moresby Island.

The AACs for the Haida Gwaii TSA and TFL management units have been altered between timber supply processes due to timber tenure ownership changes, collaborative planning processes involving the BC Government, Haida Nation and sometimes local entities, and BC Government policy and administrative decisions.

Over the past two decades, prior to the 2012 AAC determiations, the total of the AACs for the Haida Gwaii TSA and TFLs stood at a high point of 1,786,000 m^3 in 2000 and dipped to a low of 1,224,116 m^3 over the three-year 2006-09 period due to reductions stemming from land use objectives and new protected areas contemplated in the Haida Gwaii Strategic Land Use Agreement (SLUA) that the Province of British Columbia and the Council of the Haida Nation entered into on December 12, 2007.[59] The changing levels of the AACs for the Haida Gwaii TSA and TFLs over the 2000-17 period are summarized in Appendix III.

Under Section 75 of the *Forest Act*, holders of BC government awarded timber agreements and tenures can exceed their tenure's AACs by a limited amount over a multi-year "cut control" period without being penalized. However, any harvest above the cumulative AAC for the cut control period must be counted as harvest during the next period. As a consequence, within a larger management area, such as Haida Gwaii or another forest district, actual harvests can exceed an area's AAC by up to a speciefied percentage (10% in forest licences and TFLs) without the licensee being penalized under the *Forest Act*.

[59] Under Part 13 of the *Forest Act*, the Government of BC can designate areas of Crown land for up to 10 years and then suspend or vary permits, licences and plans in force within the area, and the Chief Forester can temporarily reduce the AAC of a timber tenure by an amount attributable to the designated Part 13 area. Part 13 is generally applied in support of land and resource use planning.

Cut control regulation sets a maximum (but not a minimum) on the timber harvest margin by which a tenure holder can exceed the tenure's AAC over a specified multi-year period and not incur a penalty. In general, a cut control period of five years is used for tenures with a term greater than five years. Harvest in relation to AAC for tenures with a term of five years or less are reconciled over the term of the tenure. The upper acceptable harvest exceedance is typically determined as a percentage of the aggregated AACs for the cut control period. For replaceable and non-replaceable forest licences (with an AAC greater than 10,000 m^3) and Tree Farm Licences the upper limit is 110% of the sum of AACs in the cut control period (typically five years). For Woodlot Licences, the upper limit is 120%.

If cumulative harvests are below the AAC over a cut control period, Section 75.8(1) of the *Forest Act* prohibits the carry forward of unharvested volume from one cut control period to a subsequent cut control period by a licensee (BC MFLNR 2017b).[60]

4.4.3 TSA 25 AAC Apportionment and Commitments and Licence Ownership

Haida Gwaii based ownership of Haida Gwaii tenures has greatly increased through the creation and expansion of Taan Forest Products Ltd.

Within the AAC parameter set down by the Chief Forester for a TSA (TSA 25 in the case of Haida Gwaii), under Section 10 of the *Forest Act*, the Minister has the authority to apportion (i.e. allocate) portions of the TSA's AAC to an agreement or licence tenure category (such as the Replaceable Forest Licence tenure category). This ministerial exercise is referred to as "apportionment" and typically occurs within a few months of an AAC determination for a TSA. The apportionment establishes the portion of a TSA's total AAC that can ultimately be committed to or specified in agreements or licences within each tenure category (BC MFLNR 2018b). Each timber harvesting agreement/licence in a TSA has a specified AAC or rights to harvest a specified volume of timber, with obligations to meet forest management requirements and pay stumpage to the province.

Several agreements with AAC commitments are typically in place when a new apportionment is set out for a TSA. The AACs of existing licences in the TSA are not altered due to the minister's apportionment decision.[61] The apportionment decision circumscribes however the timber harvest volume that can be allocated by the responsible ministry officials for future licence awards within a tenure category, such as the volume that BC Timber Sales can auction via Timber Sale Licences.

The minister may issue one or more new apportionment decisions between TSA AAC determinations, and, as well, new licences with specified AAC commitments may be awarded

[60] Under Section 75.8(2), the undercut (unharvested volume) may be disposed of to a person (other than the licensee) by way of a forestry licence to cut, a timber sales licence, or a non-replaceable forest licence (BC MFLNR 2018c).

[61] However, licences are subject to reductions if the TSA AAC is reduced (*Forest Act* Section 63 proportionate reduction).

and old licences may expire. The ministry typically issues an apportionment and commitment status report on an annual basis.

Because some forest licences are in place within a TSA and have AAC "commitments", the sum of AAC commitments may not align with the apportionment. As a result, commitments for a licence category can exceed or fall short of the AAC apportionment allocated by the minister and the sum of licence commitments can exceed the AAC for the TSA as a whole as determined by the Chief Forester.

The current apportionment for tenure types in TSA 25 became effective August 1, 2013 and the replaceable forest licences category accounts for the largest volume of the six listed tenure/licence categories at 213,632 m^3 or 41.7% of the TSA's AAC of 512,000 m^3 (BC MFLNR 2018b).**Error! Reference source not found.** Table 4-4 presents the current AAC apportionment and commitments for TSA 25.

Table 4-4: TSA 25 AAC Apportionment and Commitments (m^3 & % of TSA 25 AAC)

Form of Agreement	m^3	% of AAC
Replaceable Forest Licences	213,632	41.7
Husby Forest Products Ltd. (A16869)	192,044	37.5
A&A Trading (Haida Gwaii) Ltd. (A16870)	13,632	2.7
Dawson Harbour Logging Ltd. (A75084)	7,956	1.6
Non-Replaceable Forest Licences	14,210	2.8
BCTS Partnership (Taan Forest Products)	14,210	2.8
Non-Replaceable Forest Licence – First Nations	120,000	23.4
Haida Tenure (Taan Forest Products)	120,000	23.4
BCTS Timber Sale Licence/ Licence to Cut	81,658	15.9
Community Forest Agreement	80,000	15.6
Forest Service Reserve	2,500	0.5
Total Allowable Annual Cut	512,000	100.0

Source: BC MFLNR 2018b

At this time, three replaceable forest licences are held with commitments for TSA 25 timber volume, two are controlled by Husby and one by A&A. Forest Licence A16869 is directly held by Husby and has a commitment of 192,044 m^3. A Husby subsidiary, Dawson Harbour Logging Co. Ltd., holds forest licence A75084 that has a smaller commitment of 7,956 m^3 so the AAC commitments for Husby's two forest licences account for almost 40% of TSA 25's AAC and 21.9% of the HGMA's AAC. A&A holds Forest Licence A75084, which has a commitment of 13,632 m^3 (BC MFLNR 2018b). A&A acquired the licence in 2017 from Teal, which had held this forest licence and the TFL 47/58 tenure between 1999 and 2017.

The province also signed a Haida Forest Agreement with the Council of the Haida Nation in 2014 to provide a First Nations Woodland Licence over a specified mapped area for a volume of up to 120,000 m^3/year. In the interim while work is underway on that licence, a short term non-replaceable forestry licence to cut has been issued to Taan over the area. This area accounts for 23.4% of the TSA's AAC. This area also includes a small amount of volume

apportioned to BCTS (14,210 m3/year)..[62] The BC Government awarded this volume to Taan in June 2010.[63] In addition, Taan manages jointly with BCTS a volume of 14,210 m^3, which accounts for a further 2.8% of the TSA's AAC.[64] These Taan controlled volumes account for a total of 134,210 m^3 or 26.2% of TSA 25's AAC.

Taan controlled volumes account for approximately 50% of the sum of the Haida Gwaii TSA and TFL AACs, a total of 474,210 m^3.

Discussions have been underway between the BC Government and Haida Nation associated parties for the conversion of the Taan held FLTC and TFL 60 into an area-based First Nations Woodland Licence, and the arrangements to establish this new licence are expected to be soon finalized (pers. comm. Mosher, J. 2018).

TimberWest Forest Corp. (TimberWest) acquired a 60,000 m^3 forestry licence to cut in 2011 that Teal managed for TimberWest. This licence expired in 2018.

The direct apportionment for the BCTS Timber Sale Licence category stands at 81,658 m^3 or 15.9% of the TSA's AAC and 8.9% of the HGMA's AAC.

As a planning tool and policy instrument, apportionments of TSA AAC volume may be allocated by the minister for proposed and possibly under negotiation community forest agreements, woodlot licences and First Nations Woodland Licences.

The minister allocated an apportionment of 80,000 m^3 for a proposed Haida Gwaii community forest agreement (CFA) in the minister's May 18, 2011 apportionment determination for TSA 25 and this CFA apportionment volume has remained in subsequent (annual) ministerial apportionment determinations. Depending on the CFA arrangements between the BC Government and Haida Gwaii's CFA proponent (see Section 4.4.5) all or part of the CFA apportionment may be removed from TSA 25 upon the establishment of a Haida Gwaii CFA and this would likely trigger a commensurate reduction in the ministerial AAC apportionment determination for TSA 25.

Upon the completion of the conversion of the Taan-held FLTC to a First Nations Woodland Licence, the expected AAC of 120,000 m^3 for the new area-based licence would be removed from the AAC of TSA 25.

4.4.4 Haida Gwaii Woodlot Licences

Four longstanding woodlot area-based licences with AACs totalling 9,293 m^3 are located on Haida Gwaii. Their AACs were not altered after the initial HGMA AAC determination. The

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[62] This tenure is administered as a forest licence to cut (FLTC).

[63] Under Section 47.3 of the *Forest Act,* the Minister can award certain types of tenures, such as a forestry licence to cut and forest licence, directly to a First Nation "to implement or further an agreement between the First Nation and government respecting treaty-related measures".

[64] Joint planning on harvest planning roadbuilding and auctioning.

Haida Gwaii woodlot licence AACs and general locations are summarized in Table 4-5**Error! Reference source not found.**.

Table 4-5: Haida Gwaii Woodlot Licences

Licence no.	Woodlot Licence holder	Area & AAC	General location
W1841	Old Massett Village Council	478 ha & AAC of 2,120 m^3	Near Port Clements
W1840	Skidegate Band Council	422 ha & AAC of 2,000 m^3	Near Jungle Creek
W0162	G. Lavoie	465 ha & AAC of 2,445 m^3	Lawn Hill Area
W0161	D. Younger	477 ha & AAC of 2,728 m^3	Near Port Clements

Source: BC MFLNR undated

4.4.5 Community Forest

Communications between the Province of BC, Haida Gwaii communities and the Haida Nation about the establishment of a community forest on Haida Gwaii started in the mid 1990s with a memorandum of understanding between the BC Government and – signed in 1996 which included an offer of 56,000 m^3 and a rider that a further 25,000 m^3 would be identified through a new AAC determination process.These communications between the Government of BC and Haida Gwaii parties about the establishment of a community forest on Haida Gwaii have been (intermittently) ongoing over the following years.[65]

The Province of BC's offer was broadened in 2010 to a Community Forest Agreement for all island communities, and with Misty Isles Economic Development Society (MIEDS) as the Haida Gwaii CFA proponent. This offer incorporated a volume of 80,000 m^3 per year provided that the communities enter into a partnership with BCTS to deliver the entire 80,000 m^3 to help support the province-wide market pricing delivered through the BCTS auctions of Timber Sale Licences (TSLs).

[65] Abbreviated summaries of several events or milestones between 1996 and to date about creating and establishing a Haida Gwaii community forest are presented on the Haida Gwaii Community Forest web site (see https://haidagwaiicommunityforest.com/community-forest-timeline/). The information in the sub-section of this socio-economic report summarizes the current status of the Haida Gwaii community forest and a few past events but does not recapitulate all events and milestones. Parties interested in additional information should review the cited web pages and the community forest options report prepared by a Haida Gwaii-based consultant for Misty Isles Economic Development Society (Moore Resource Management 2016).

This proposal was the basis for the minister for the first time (in May 2011) apportioning TSA 25 AAC volume (80,000 m^3) to the community forest agreement category in a ministerial apportionment determination. This TSA 25 apportioned volume of 80,000 m^3 for a community forest agreement has remained in all subsequent annual apportionment status reports.[66]

Over the 2012-204 period, in advance of setting up and finalizing a CFA, the Ministry provided a transitional volume of 125,000 m^3 to MIEDS in order to mitigate the effects that designated areas associated with the Haida Gwaii Strategic Land Use Plan implementation had on the earlier 2004 invitation from the Government to the Village of Masset to apply for a community forest.. This volume was tenured to MIEDS as a Forestry Licence To Cut and Non-Replaceable Forest Licence and delivered by BCTS under three business-to-business agreements between MIEDS and BCTS. Under the agreements BCTS paid MIEDS a monetary consideration of approximately $600,000 or an average of $4.80/$m^3$ over three years (pers. comm. T. Johnson 2018).

In 2016, Misty Isles Economic Development Society commissioned a consultant to research and write a report on potential options for a Haida Gwaii community forest agreement (Moore Resource Management 2016). At a January 2017 meeting with ministry representatives, Misty Isles Economic Development Society representatives asked that the Province of BC issue a formal offer for a Haida Gwaii community forest. Subsequently, in a December 2017 letter from the Regional Executive Director of the West Coast Forest region to the Chair of Misty Isles Economic Development Society, the Province of BC invited Misty Isles Economic Development Society to submit an application for a Community Forest Agreement.

The December 2017 BC Government CFA proposal included a specific mapped area for the community forest and an offer of approximately 80,000 m^3/year with a reduced volume condition in which 55,000 m^3 per year would be sold by BCTS to help support the province-wide market pricing system.[67] The net revenue on the BCTS portion of the CFA would be shared between BCTS and MIEDS on a 50:50 basis in accordance with regulation (Hadway 2017). This latest invitation to submit a CFA application has since been extended by the Ministry to July 2019. Under the reduced volume condition, BCTS is responsible for silviculture obligations on TSLs that BCTS auctions (pers. comm. T. Johnson 2018).

The largest part of the BC Government proposed CFA area is on the east side of Massett Inlet, in the Drizzle/Watt/Loon Lake area between Masset and Port Clements. Other areas

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[66] The harvest planning and administration for this 80,000 m^3 of CFA category volume in TSA 25 has been managed to date by BCTS.

[67] The typical practice is for the offered CFA AAC apportionment to be removed from a TSA upon signing of the Community Forest Agreement similar to the way in which all area-based agreements are handled. Given the proposed re-direction of 55,000 m^3 of the Haida Gwaii community forest's AAC to BCTS management, this 55,000 m^3 is likely to remain as an apportioned TSA 25 AAC volume.

include an area south of Tlell, the Honna River area from west of Queen Charlotte to north of Skidegate, as well as the Sewell/Tasu and Skidegate Lake areas on Moresby Island.

The subsidiary established by Misty Isles Economic Development Society to manage the local community forest, Haida Gwaii Community Forest, prepared a draft management plan to facilitate discussions with Haida Gwaii stakeholders, the BC Government and Haida Nation (Misty Isles Economic Development Society 2018). At this time, Misty Isles Economic Development Society continues to discuss this latest Community Forest Agreement proposal and potential revisions to it with local stakeholders, the Haida Nation and the Ministry.

4.5 BCTS Timber Sales

Haida Gwaii-focused forestry companies have won the majority of BCTS' competitive auctions for Haida Gwaii TSLs over the 2008-2017 period

BCTS' competitive auction system for Timber Sale Licences (TSLs) provides the basis for collecting the market price information used to help determine BC Government stumpage rates. On a province-wide basis BCTS has annual targets of auctioning a Section 20 TSL volume that is equivalent to a minimum 20% of the total projected provincial harvest volume for the year. For the 2017-18 fiscal year, BCTS auctioned 19% of the projected coastal BC public lands harvest and 20% of the projected BC Interior harvest (BCTS 2018b).

The recent experience on Haida Gwaii shows that over the four-year 2013-2016 period following the initial HGMA AAC determination BCTS auctioned an annual average of approximately 132,000 m^3 of TSL volume which represented about 15% of the HGMA lands average annual harvest (for the 2013-2016 period) and about 75% of the total of the BCTS AAC apportionment, the CFA AAC apportionment and the BCTS-Taan NRFL commitmentand (BCTS undated).

The BCTS AAC apportionment on Haida Gwaii has shifted up and down over the 2008-2017 periodand is shown in Table 4-6.

Table 4-6: BCTS' AAC apportionment for TSA 25 (m^3), 2008-2017[68]

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
BCTS AAC	91,978	91,978	62,661	174,819	174,819	81,658	81,658	81,658	81,658	81,658

Source: BC MFLNR various

Parties associated with Haida Gwaii-focused forestry companies made the majority of TSL winning bids in BCTS's Haida Gwaii timber auctions over the 2008-2017 period, an estimated

[68] By apportionment effective date as stated in BC MFLNR's annual reports on TSA 25's AAC, Apportionment and Commitments

47 of the 57 TSL auctions.[69] These winning bids by Haida Gwaii-focused forestry operations account for an estimated TSL volume of 1,040,022 m^3, 79.0% of the total TSL volume of 1,316,267 m^3 that BCTS awarded on Haida Gwaii over the 2008-2017 period. The subset of Haida Gwaii headquartered forestry enterprises accounted for an estimated 760,736 m^3 and 38 TSL winning bids, 57.9% of the BCTS awared volume(BCTS 2018a).[70]

In large measure, this result for Haida Gwaii TSL auctions was likely due to the cost competitiveness and bidding prowess of the Haida Gwaii focused logging operations through their knowledge of local logging and transport operating conditions and timber fibre attributes and having Haida Gwaii resident employees and Haida Gwaii-based equipment which translates into transport cost savings. The winning bidders of BCTS Timber Sale Licence auctions for Haida Gwaii and the location and volumes of these timber sale licenses over the 2008-2017 period are listed in Appendix IV.

4.5.1 Cedar Timber Supply and Cedar AAC Targets

A cedar partition on Haida Gwaii influences the total harvest on the islands because harvest planning and decisions by most Haida Gwaii tenure holders are greatly influenced by the volume of commercially operable cedar in stands being considered for harvesting

In its initial April 2012 AAC rationale, the HGMC recommended that the Chief Forester set up a legal AAC partition or allocation for the harvesting of cedar, inclusive of (Ts'uu) western redcedar and (Sgaahlan) yellow cedar, in the Haida Gwaii TSA and TFLs (HGMC 2012). In the September 2012 AAC rationale, the Chief Forester acknowledged this HGMC recommendation but opted instead to introduce non-legal maximum cedar havest levels (targets) with respect to the harvesting of red and yellow cedar in the Haida Gwaii TSA and TFLs (Sutherland 2012). The cedar AAC targets were as follows.

- 195,000 m^3 in TSA 25, (equivalent to 38% of the new AAC512,000 m^3);
- 32,000 m^3 in TFL 58 (equivalent to 41% of the new AAC of 79,000 m^3); and
- 133,000 m^3 in TFL 60 (equivalent to 39% of the new AAC of 340,000 m^3).

The AAC cedar targets for the three Haida Gwaii management units totalled to 360,000 m^3.

The overall harvest of most Haida Gwaii tenure holders was directly influenced by their attempts to manage their cedar harvest in order to comply with the maximum cedar harvest levels attached to the overall AAC allocation.

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[69] The Haida Gwaii focused forestry enterprises residents that made winning bids for TSLs over the 2008-2017 decade was comprised of Taan Forest Products, O'Brien & Fuerst (several persons), Abfam, C Gamble, I. Crosby, Husby and Infinity West (including A Lowen).

[70] The Haida Gwaii headquartered forestry enterprises or residents that made winning bids for TSLs over the 2008-2017 decade are Taan Forest Products, O'Brien & Fuerst (several persons), Abfam, Gamble and I. Crosby.

The harvesting of red and yellow cedar was monitored in these management units over the subsequent three years. The Haida Nation and the Province of BC jointly found that harvesting of cedar by TSA 25 licensees cumulatively exceeded this "soft" partition and that the TFL 58 and 60 tenure holders were in compliance with the cedar maximums.

In an October 24, 2017 letter, the Chief Forester observed that cedar harvest levels in TSA 25 continued to exceed the 2012 direction and that no cedar management strategy had been developed for Haida Gwaii as per the request in the 2012 Chief Forester rationale. In the October letter, the Chief Forester established a partition under section 8(5) of the *Forest Act* of no more than 195,000 m^3 of cedar within TSA 25's AAC of 512,000 m^3. On August 24, 2018, the minister followed up this step by signing a cedar focused partition order applicable to TSA 25 eligible licences (which are replaceable forest licences). Accompanying this order was a letter from the Minister directing BCTS to limit cedar harvesting in the TSA to their proportionate share of the cedar partition.[71] In conjunction with the Chief Forester's October 2017 establishment of a cedar partition, Taan issued a cedar strategy for the Haida Tenure that obligates Taan, starting January 1, 2018 and for a five-year period, to limit the cedar harvest in the Haida Tenure as per the Chief Forester's direction (Mosher undated). Similarly, Husby issued a cedar strategy for its TSA 25 forest licences that obligates Husby, starting January 1, 2018 and for a five-year period, to limit the cedar harvest in the Haida Tenure as per the Chief Forester's direction (Husby 2018).

4.5.2 Log Export Regulation

Supply of Haida Gwaii timber into both BC markets and international export markets, and therefore the overall timber harvest and its associated economic effects, is directly influenced by BC Government and federal government log export regulatory systems

Regulation of log exports at both the federal and BC Government levels has been in place since the 1880s and both jurisdictions have revised their log export regulations several times over the intervening decades (Shinn 1993; Dumont and Wright 2006). Since the early 1900s, the BC Government, and, since the late 1940s, the federal government have relied mainly on a manufacture surplus test approach to help control log exports and thereby assist BC timber processing facilities to have access to BC logs at a BC market price.

The BC and federal government systems differ markedly in the regulation of cedar log exports, however. In general, prospective log exports harvested on either private lands classified as non-exportable Crown grant (i.e. provincial export jurisdiction private lands) or BC public lands are subject to a manufacture surplus test, a fee in lieu of manufacture and either an explicit or implicit prohibition on export of red and yellow cedar logs. Logs harvested from private lands classified as exportable Crown grant (i.e. federal export

[71] The Minister may issue partition orders that are only applicable to forest licences that have an AAC of greater than 10,000 m^3. The *Forest Act* does not provide the authority for the Minister to issue partition orders to other types of tenures, such as a TSL or a FLTC.

jurisdiction private lands) must pass a manufacture surplus test prior to their export but log owners are not subject to paying a fee in lieu of manufacture and, as well, since 1998, red and yellow cedar logs harvested on these federal jurisdiction private lands have not been prohibited from export.[72]

Logs harvested on Indian Reserve lands are not subject to a manufacture surplus test and are generally eligible for export subject to applicable band council and DIAND authorization.

Another key difference in log export regulation between the Province of BC and the federal government is that, starting in the mid-1980s, the BC Government began issuing exemptions from the manufacture surplus test and reducing fees in lieu of manufacture for defined regions, time periods and timber harvest volumes.[73] These exemptions were awarded on the basis that a region had little local wood processing capacity and in general had a weaker economy. Therefore, region specific export log regulation has been present in BC for about 30 years and Haida Gwaii specific export regulation of logs harvested on public lands and provincial export jurisdiction private lands has been in place for approximately eight years.

In 2010, the Minister and the BC Cabinet issued an exemption order-in-council applicable to Haida Gwaii.[74] The Haida Gwaii Timber Exemption Order allows for a proportion of timber harvested on HGMA lands and provincial export jurisdiction private lands, other than red cedar and cypress (yellow cedar) timber, to be "considered surplus to requirements of timber processing facilities in British Columbia" and therefore not subject to the surplus manufacture test (Government of BC 2010).[75] The volume of timber considered to be surplus is capped at 35% of a tenure holder's total harvest volume (including scaled waste and red and yellow cedar volume).[76] A reduced fee in lieu of manufacture specified in the order-in-council must be paid to the BC Government by the export log owner for the exempted volume (Government of BC 2015). In addition, parties can attempt to export logs that result in an exceedance of the 35% cap by submitting these additional log volumes into the BC Government's manufacture surplus test process. This OIC is currently due to expire on July 31, 2019.

4.6 Haida Gwaii Timber Harvest

4.6.1 HGMA Timber Harvest Volume

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[72] Between 1984 and 1998, export of cedar logs from federal jurisdiction private lands were prohibited from export.

[73] Through an order-in-council

[74] Orders made in 2015 and 2018 extended the time period of the original 2010 Haida Gwaii order. Between the mid-80s and 1992, there were several OICs, often called "market logger" OICs, which provided smaller, coastal BC operators an exemption from the manufacture surplus test for about 15% of their harvests (subject to certain restrictions).

[75] This OIC and similar ones for other Coastal BC areas are sometimes referred to as "blanket exemptions".

[76] If the cedar volume is 40% of total volume then the tenure holder can effectively export 58% of the remaining 60%.

The 5-year average harvest of 831,172 m³ for the 2013-17 period, which coincides with the April 2012 HGMC determination, shows a shortfall of about 10% relative to the HGMA AAC

The billed timber harvest level in the Haida Gwaii Management Area was 645,076 m³ in 2017, and an annual average of 733,226 m³ over the 10-year 2008-17 period. The 2017 harvest level is 30.1% (283,924 m³) below the current HGMA AAC of 929,000 m³. The 2017 harvest on HGMA lands was the lowest by a large margin within the 5-year 2013-17 period.

The 2016 harvest of 956,471 m³ and the 2013 harvest of 999,004 m³ both exceeded the April 2012 HGMA AAC. However, the 5-year average harvest of 831,172 m³ for the 2013-17 period, which coincides with the April 2012 HGMC determination, shows an undercut of about 10% relative to the HGMA AAC. The 877,696 m³ average harvest for the 4-year 2013-16 period stands at about 95% of the HGMA AAC.

The most recent 3-year 2015-17 annual average harvest in the HGMA, 805,854 m³, exceeded the 10-year 2008-2017 annual average of 733,226 m³ but was under the 5-year 2013-2017 annual average harvest of 831,172 m³ because of the harvest volume dip in 2017 to 645,076 m³.

The average annual harvest over the earlier 2008-2012 period was 635,280 m³. Every annual total timber harvest in the earlier 5-year period of 2008-2012 for the Haida Gwaii TSA, TFLs and WLs was below the sum of their AACs (which ranged from 1,231,592 m³ to 1,780,092 m³). In four of those years, 2009 through 2012, the Haida Gwaii harvest averaged only 520,336 m³ per year i.e. only 30% of the then allowed maximum harvest. This gap between actual harvest and potential harvest primarily reflected weakness on the demand side due to the severe downturn in US housing starts and the general global economic downturn precipitated by the 2008 financial crisis, along with local administrative and planning constraints on finalizing and issuing plans and cutting permits and developing harvest infrastructure due to on islands land use planning, political protests and changes in tenure control. Another factor is that weak demand in end use markets for cedar, hemlock and spruce wood products feeds back into downward pressure on demand for Haida Gwaii timber because the comparatively higher cost Haida Gwaii harvest competes against lower cost timber options.

The shortfall between the actual harvest and a potential harvest (as represented through the AAC) is a general situation across the province and not unique to Haida Gwaii.[77]

During the 10-year 2003-2012 period prior to the initial HGMC AAC determination, the Haida Gwaii annual timber harvest averaged approximately 780,000 m³, well below the

[77] For a graph and data showing the BC timber harvest compared against the total AAC for BC see the Government of BC's online State of the Environment report for the timber harvest indicator, http://www.env.gov.bc.ca/soe/indicators/land/timber-harvest.html

cumulative total of the then current Haida Gwaii AACs and below the average annual harvest for the 5-year 2013-2017 period

Although the available timber supply for annual harvesting was in the 1.2M – 1.8M m^3 range over 2000 – 2012, the amount of timber harvested by commercial operators and supplied into domestic and international markets fell well short of these levels due to target market demand conditions, cost constraints, and administrative and policy parameters on the Haida Gwaii timber supply side.

This ten-year 2003-2012 period includes intervals of strong demand for cedar and spruce log and wood products in target markets that bookended a period of weak demand due to the crash in the US housing market and the 2008 global financial crisis. The introduction of the Haida Gwaii Exemption Order in 2010 gave a strong boost to the offshore demand for local hemlock and spruce logs but was especially important in terms of improving the overall financial viability of harvesting Haida Gwaii stands with their heavy hemlock components as the offshore prices for hemlock logs well outstripped their domestic prices.

Demand conditions for specific species, whether western redcedar or hemlock, and demand conditions in specific sectors (such as new housing) in specific markets (such as the US) and supply conditions in more cost competitive markets (Russian softwood logs to China for example) were the main factors determining the Haida Gwaii harvest during the 2003-2012 period. Constraints on timber supply due to local protests and associated administrative and policy decisions by BC Government and Haida Nation entities, including the introduction of and adjustment to EBM and the Haida Gwaii Land Use Order were very important factors affecting the Haida Gwaii harvest starting in 2005.[78]

Haida Gwaii's timber harvest and transport costs, across species, sit at the upper end of a cost curve that includes harvest and transport costs for equivalent softwood fibres (and substitutable non-wood materials) from other regions (See Section 4.10). This high timber supply cost situation on Haida Gwaii exerts a strong downward pressure on demand for Haida Gwaii hemlock timber, which accounts for around half of the HGMA timber supply, and sets up a difficult competitiveness challenge for Haida Gwaii harvesters of hemlock logs. The much higher prices for Old Growth and Second Growth cedar logs and Old Growth spruce logs compared to hemlock log prices, even in weak demand markets, help buoy up the viability of Haida Gwaii timber harvesting despite the relatively high Haida Gwaii harvest and transport costs.

As outlined in Section 4.3, the Haida Gwaii harvest, over the past couple of decades, has been largely pulled along by the demand in US housing and home renovation markets for products

[78] These local supply side constraints are encapsulated in the following observation in Taan's FSC Management Plan, "Harvest levels in the past have been significantly lower than the Annual Allowable Cut as a result of poor economic conditions and curtailed operations and implementation of the Land Use Order." (Taan FSC Management Plan May 2018)

made from Old Growth western redcedar fibre. However, the evolution of the markets for commodity softwoods fibre in China has transformed the financial viability of harvesting Haida Gwaii hemlock although cost competition is intense in this market from softwoods suppliers in Russia, especially, along with New Zealand and Australian plantation suppliers (and even from other BC suppliers of hemlock logs having lower harvesting and transport costs).

The Haida Gwaii AACs represent a potential maximum commercial harvest and the shortfalls between the actual Haida Gwaii harvest and this maximum allowable harvest is to be expected in weaker demand markets. The shortfalls may even occur in years when log prices are relatively strong because of Haida Gwaii's higher costs of logging, processing and transport, the administrative and policy constraints influencing local timber supply availability. and the targeting of of cedar timber in making decisions on the commercial viability of logging Haida Gwaii stands. The overall Haida Gwaii harvest experience up to 2017 compared against the 2012 AAC determinations, given the relatively good markets for Haida Gwaii timber, suggests that the maximum potential harvest (represented through these 2012 AACs) during this 2013-2017 period was appropriate from an economic or commercial perspective (along with ecological and cultural perspectives) given the local supply side constraints in making timber available for harvest on Haida Gwaii.

Timber Harvest by Management Unit

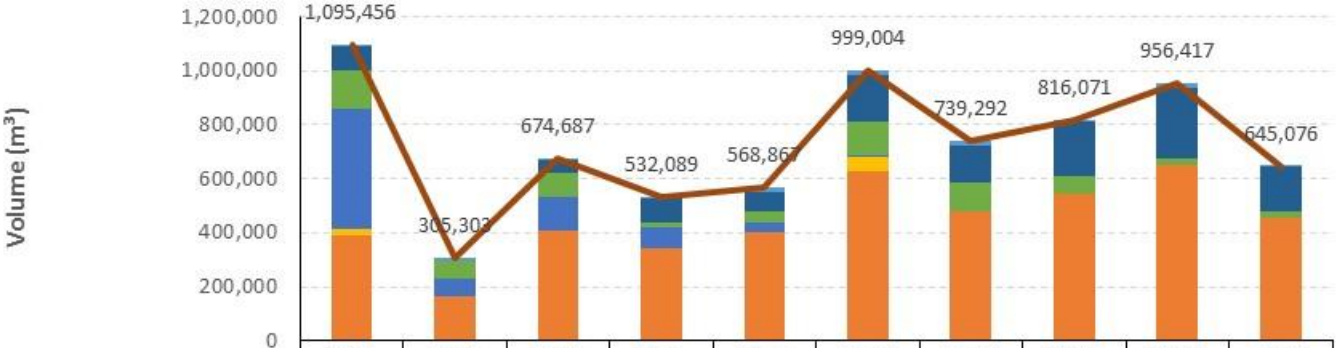
The TSA 25 average annual harvest over the 5-year 2013-2017 period subsequent to the initial HGMA AAC determination was 551,590 m^3, which exceeds the AAC of 512,000 m^3 for TSA 25 by about 7.8%.[79]

The shortfall between the HGMA harvest and AAC over this 5-year period cited in the previous section was due to annual harvesting in TSA 58 and TSA 60 being below their AACs (79,000 m^3 and 340,000 m^3, respectively). From a management unit perspective, the gap between the actual HGMA harvest and maximum potential harvest as represented via the AAC appears to be due primarily to the shortfall in TFL 60, which had an annual average harvest of 186,364 m^3 for the 5-year 2013-2017 period (55% of its AAC).

[79] In addition to harvesting to cut control limits, a couple of administrative factors can push a TSA harvest over a TSA AAC within a cut control period. The harvest figures can include TSLs that had been sold up to four years prior to a current year and that are just being harvested in a current year. Another possibility is that timber may have been logged prior to the AAC coming into effect but the (commercial and waste) timber was billed and registered in the Harvest Billing System after the AAC came into effect. Temporally identifying actual harvest activity using harvest billing system data is a complex matter.

Figure 4-8 outlines in a graph and a table the HGMA billed/invoiced harvest volume by management unit over the 10-year 2008-17 period.[80]

Figure 4-8 HGMA Timber Harvest by Management Unit (m^3), 2008 - 2017



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Woodlots	4,184	10,199	4,346	5,613	20,531	12,661	16,880	7,261	20,061	2,215
TFL 60 Haida Gwaii	90,580	124	46,503	90,285	69,017	173,781	137,748	196,546	258,527	165,219
TFL 58 Morseby Island	140,560	64,651	90,299	17,732	42,362	126,082	105,778	65,900	24,269	23,594
TFL 39 Haida	446,127	62,801	123,738	73,400	36,627	4,186	2,500	0	0	0
TFL 25 Naka	25,599	650	2,140	540	0	54,696	0	0	0	0
Haida Gwaii TSA 25	388,406	166,877	407,661	344,519	400,329	627,598	476,385	546,363	653,560	454,047
Total	1,095,456	305,303	674,687	532,089	568,867	999,004	739,292	816,071	956,417	645,076

Source: Harvest Billing System 2018 and author's calculations[81]

[80] Harvest data in this socio-economic report is from the BC Government's Harvest Billing System and is the harvest by date of invoice. The harvest data reported herein includes avoidable waste volumes as per standard reporting practice. The harvest data reported in this socio-economic report was downloaded by and directly supplied to the report's authors by an employee of the Ministry's Timber Pricing Branch.

Harvest data in the Harvest Billing System is also available by scale date. The timing of the harvest volume varies slightly by year between the two datasets but the amount of the harvest is almost the same in each dataset over a 10-year period. Invoicing typically occurs roughly a month after scaling. The date of invoice dataset is used in this socio-economic report because revenue data is also reported upon.

[81] In regard to TFL 25 Naka, in the early 2000s TFL 25 covered 480,000 hectares of forests in 5 blocks in the following areas: Jordan River, Loughborough Inlet, Naka Creek on Vancouver Island, Bella Bella and Kitimat on the Central Coast, and on Haida Gwaii's Moresby Island. In 2010, Block 6 (Haida Gwaii) was deleted from TFL 25 and added to the Haida Gwaii Timber Supply Area. Currently TFL 25 is comprised of the blocks near Loughborough Inlet and Bella Bella and covers approximately 196,000 hectares. Block 1 (Jordan River) and Block 3 (Naka Creek) were also deleted from TFL 25. WFP holds the TFL 25 tenure today and held it when this TFL included an area on Moresby Island.

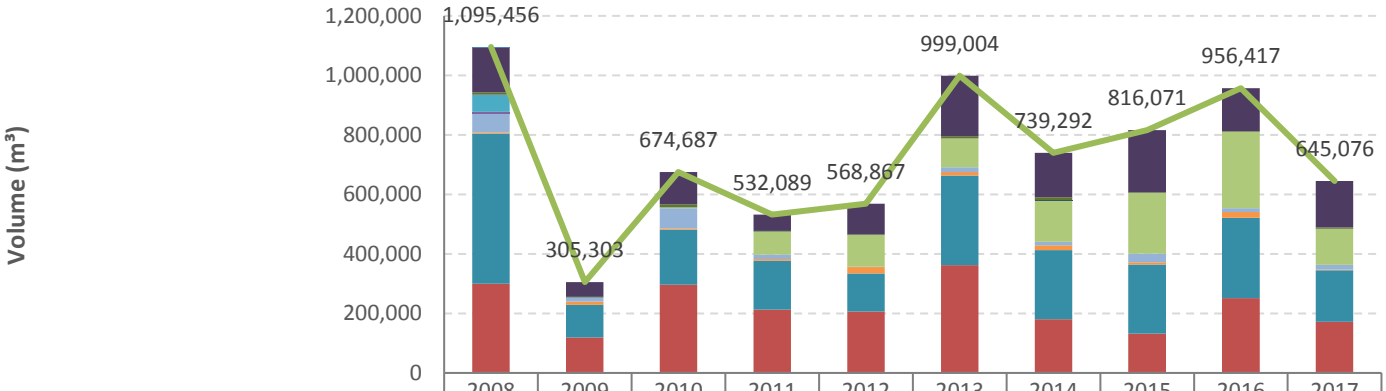
Timber Harvest by Tenure Type

Over the 2013-2017 period, the timber harvest by Timber Sale Licensees was an annual average of 171,896 m³, slightly greater than the sum of the AAC apportionments for BCTS and the CFA of 161,658 m³.

The combined harvest of TSA 25 forest licensees averaged 185,592 m³ during the 2013-2017 period, slightly below the AAC apportionment of 213,632 m³ for replaceable forest licences. In the earlier 2008-2012 period, the TSA 25 forest licensees had an annual average harvest of 226,849 m3, which was below the AAC apportionment for replaceable forest licences in most of those years.

The FLTC with cutting permits tenure averaged an annual harvest over the 7-year 2011-2017 period of 143,375 m³.. Figure 4-9 outlines in a graph and a table the HGMA billed harvest volume by tenure type over the 10-year 2008-17 period.

Figure 4-9: HGMA Timber Harvest by Tenure Type (m³), 2008-2017



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
SB TSL S21 Bid Proposal single mark	2,946	0	0	0	0	0	0	0	0	0
SB TSL S20 single mark	149,763	49,914	108,084	54,652	103,151	202,997	148,894	208,269	143,491	155,833
Forestry Licence to Cut	6,934	1,933	9,424	2,005	2,795	7,728	9,395	1,117	1,401	3,199
Occupant Licence To Cut, Short Form	1,436	0	0	0	0	0	0	40	379	426
Occupant Licence To Cut	0	0	0	0	0	0	1,209	0	0	0
Road Permit	56,592	103	413	79	0	0	231	1,369	497	133
SB TSL S21 Bid Proposal multi-mark	4,847	0	0	0	0	0	0	0	0	0
Forestry Licence to Cut with Cutting Permits	0	0	3,149	77,440	106,491	96,698	138,872	204,634	257,242	122,252
Timber Licence	63,990	14,206	67,697	15,316	1,156	15,970	11,435	28,486	12,189	16,081
Woodlot Licence	4,184	10,199	4,346	5,613	20,531	12,661	16,880	7,261	20,061	2,215
Tree Farm Licence	504,939	109,284	184,993	164,732	128,818	301,094	231,860	232,921	269,878	172,599
Forest Licence	299,826	119,664	296,581	212,252	205,924	361,855	180,515	131,974	251,278	172,337
Total	1,095,456	305,303	674,687	532,089	568,867	999,004	739,292	816,071	956,417	645,076

Source: Harvest Billing System 2018 and author's calculations

4.6.2 HGMA Timber Harvest by Species

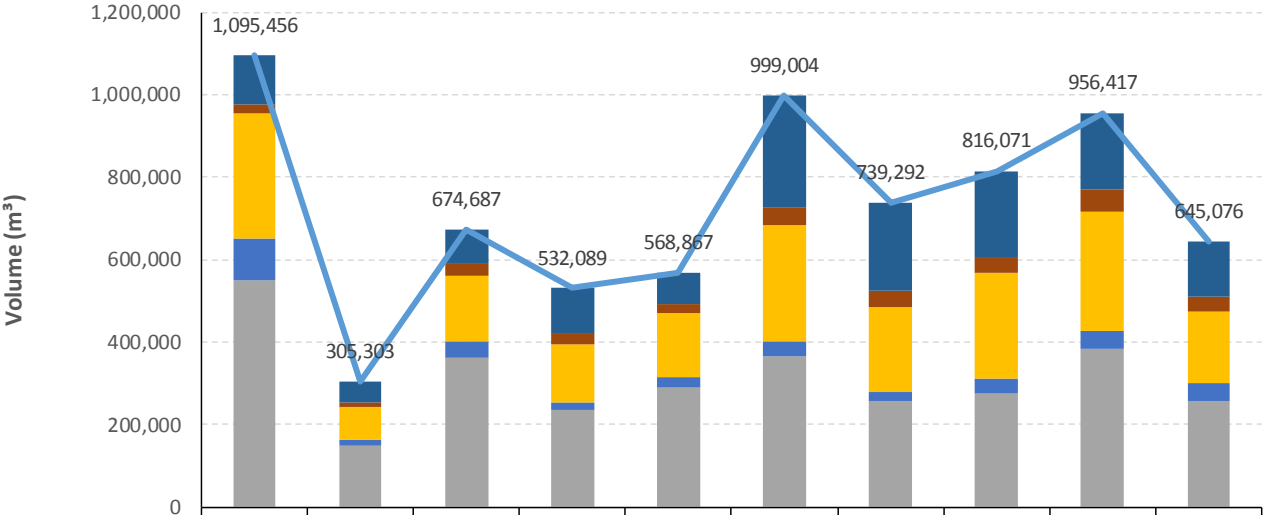
Harvesting of cedar timber in response to strong demand in external markets for cedar wood products has largely pulled along the overall Haida Gwaii timber harvest

Historically, timber stands with substantial percentages shares of Old Growth western redcedar volumes have formed a large portion of the operable harvesting landbase of Haida Gwaii. This accessible local cedar supply in combination with the strong and large scale external demand for cedar logs and wood products in Canadian, US and international markets over the past couple of decades, have resulted in attractive prices for cedar logs and wood products and substantial cedar timber harvests on both HGMA lands and Haida Gwaii private lands.

Over the 2008-2017 decade, the harvest of red and yellow cedar annually averaged approximately 351,000 m^3, accounting for an almost half share (47.8%) of the total HGMA harvest. Red and yellow cedar's share of the total harvest fluctuated within a wide band of more than 20 percentage points over this period, a high of 59.5% in 2008 and a low of 37.6% in 2014. The HGMA's red cedar harvest share peaked in 2010 at 54% and the yellow cedar harvest at 9.3% in 2008. The highest cedar harvest volume in the HGMA occurred in 2008 at 651,731 m^3, followed by the harvest of 427,370 m^3 in 2016.

Over the 5-year 2013-2017 period, the cedar share of the HGMA total harvest was lower (41.4%) compared to the 10-year average share.

Figure 4-10: HGMA Timber Harvest Volume by Species (m^3), 2008 - 2017



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Spruce	118,455	51,192	85,031	112,329	75,143	270,736	214,499	212,189	187,211	134,050
Other Species	20,394	9,989	29,083	24,286	23,739	44,403	39,024	36,984	51,329	37,436
Hemlock	304,876	79,393	160,100	142,452	153,689	282,740	207,896	255,562	290,507	171,455
Cypress	101,987	16,471	36,380	17,978	25,343	35,601	18,517	34,197	43,522	44,462
Red Cedar	549,744	148,258	364,093	235,045	290,953	365,525	259,356	277,140	383,848	257,673
Total	1,095,456	305,303	674,687	532,089	568,867	999,004	739,292	816,071	956,417	645,076

Source: Harvest Billing System 2018 and author's calculations

Excepting the 2010 harvest, hemlock's share of the HGMA harvest stayed within a narrow band of between 23.7% to 31.3% and averaged 27.9% during the 2008-2017 decade. Spruce accounted for 19.9% of the HGMA harvest, on average, and the years of its peak share (2014) and low share (2008) overlapped in the reverse with that of the two cedar species. The percentage shares by species of the HGMA harvest for the 2008-2017 period are presented in Table 4-7.

Table 4-7: HGMA Timber Harvest Share by Species (%), 2008 - 2017

Species	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	10-year average
Red Cedar	50.2%	48.6%	54.0%	44.2%	51.1%	36.6%	35.1%	34.0%	40.1%	39.9%	42.7%
Yellow cedar (Cypress)	9.3%	5.4%	5.4%	3.4%	4.5%	3.6%	2.5%	4.2%	4.6%	6.9%	5.1%
Hemlock	27.8%	26.0%	23.7%	26.8%	27.0%	28.3%	28.1%	31.3%	30.4%	26.6%	27.9%
Spruce	10.8%	16.8%	12.6%	21.1%	13.2%	27.1%	29.0%	26.0%	19.6%	20.8%	19.9%
Other	1.9%	3.3%	4.3%	4.6%	4.2%	4.4%	5.3%	4.5%	5.4%	5.8%	4.3%

Source: Harvest Billing System 2018 and author's calculations

As a consequence of the large-scale cedar timber harvest on HGMA lands and private lands, management of the cedar harvest on the islands has been a long-standing focus of research, discussion, negotiation and sometimes political conflict.

The portion of the HGMA AAC affected by the cedar partition limits set out in 2012 summed to 360,000 m^3. The annual average cedar harvest in the HGMA was slightly lower at 343,968 m^3. Cedar harvesting was within the maximum partition limits in TFL 60 and TFL 58 but not in TSA 25. In October 2017, the Chief Forester acknowledged that the logging of cedar in TSA 25 "has exceeded the levels outlined in the chief forester's 2012 management unit AAC determinations". As described in Section 4.5.1, via this October 2017 letter the Chief Forester established a partition under section 8(5) of the *Forest Act* of no more than 195,000 m^3 of cedar within TSA 25's AAC of 512,000 m^3 and associated measures were taken to provide for compliance by TSA 25 tenure holders.

4.6.3 HGMA Harvest Residues

To date, commercially viable market opportunities for Haida Gwaii logging and wood processing residues have proven to be limited but residue utilization initiatives for Haida Gwaii are in the planning stages

Avoidable logging wastes associated with HGMA harvests accounted for about 960,000 m^3 of fibre over the 2008-2017 decade, an annual average of about 96,000 m^3 and 13% of the Haida Gwaii TSA and TFL harvests (HBS 2018 and author's calculations).[82] The Haida Gwaii level of residues is less than the 19% level of avoidable wastes for the overall coastal BC region. This lower level of avoidable wastes on Haida Gwaii is likely due to the relatively high quality of the Old Growth hemlock and Sitka Spruce fibres on the islands and the long-established salvage operations on Haida Gwaii. Over the past decade on coastal BC avoidable wastes accounted for an annual average of approximately 2.6M m^3 of fibre or about 1 m^3 for every 4.25 m^3 of cut and removed timber (Rudson 2018).

Several small Haida Gwaii forestry enterprises have timber salvage harvest agreements with major tenure holders and/or they access small scale salvage licences. These small enterprises are removing commercially viable logs and cedar blocks from blowdown areas and old cutblocks. Periods of high winds on Haida Gwaii create substantial annual volumes of blowdown timber, anecdotal reports suggest 40,000 to 50,000 m^3 annually (Stirling 2012). The main companies on Haida Gwaii that are engaging in timber salvage at this time are the following: Watchmen Forest Products Ltd., North Pacific Timber, Maximum Cedar Recovery, Tree Surgeon, Against the Grain Forest Products, Haida Gwaii Log Salvage & Towing and Silva Services.

Several bioenergy facilities in BC were built to take advantage of sawmill residuals, the lowest cost source of fibre, however they acquire ground or chipped debris, a more expensive

[82] Avoidable waste volumes are counted as harvest volume against licensee AACs.

feedstock, when sawmill and shake and shingle mill production decreases or to fill specific fibre requirements or to leverage the sunk costs of underutilized generation capacity (Industrial Forestry Service 2015). In 2008, the BC Government issued a bioenergy strategy with a goal of producing half of the province's renewable energy production from BC-made biofuels by 2020. The BC Bioenergy Network funded through this initiative has invested in 18 pilot and technology demonstration projects to date.[83]

As well the BC Government has facilitated several measures to help improve the use of post-harvest debris, including establishing fibre recovery zones (for planning processes) and fibre recovery tenures.[84] A large volume of logging debris is present in BC, an estimated average of 3.8 million m^3 per annum over the 2010-2024 period and an average of 6 million m^3 per annum in recent years.[85] Although the physical supply of logging debris at the roadside is very large in the province, the economic supply, the amount that can be supplied at prices energy facility operators can pay, is much smaller. The supply of roadside residues for bioenergy feedstock purposes varies by region and economic accessibility.[86] There are a variety of potential end use buyers of processed logging debris. An example of how this niche business is starting to expand within the BC forest industry on a business-to-business basis is the acquisition in late 2011 of Renew Resources by a unit of the BC-headquartered Ledcor Group of Companies. Renew Resources was a company of approximately 200 employees that produced wood chips and hog fuel in Merritt, and trucks the ground and chipped materials to a Mission re-load facility on the Fraser River where the chips are barged to Howe Sound Pulp and Paper (HSPP) on the Sunshine Coast. The ground fibre helps fuel HSPP's 400 GWh combined heat and power (CHP) facility that supplies electricity to BC Hydro and heat for its paper-making.[87] Ledcor has created a vertically integrated fibre sourcing, processing and transporting operation to meet the biomass input needs of mills that combine CHP and pulp and paper production.

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83 See http://bcbioenergy.ca/

84 See the following for additional descriptions, https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/timber-tenures/fibre-recovery/topic_2__initiatives__to_utilize_post_harvest_residual_fibre.pdf

85 Author's calculation to convert annual available biomass from GWh/year to m^3/year. GWh/yr data is from a recent study commissioned by BC Hydro, which estimated the supply of roadside residues in BC, see pg 14 in Industrial Forestry Service, M.D.T. Ltd. and Murray Hall Consulting Ltd. 2010.

86 The cited BC Hydro commissioned study provides a breakdown by region of total roadside residue supply.

87 In the press release announcing the acquisition, the president of the Ledcor unit said "…Ledcor Resources and Transportation is creating significant employment opportunities to utilize and create value from marginal wood fibre that would have otherwise been slash burned or left on the forest floor. Instead of doing nothing about a waste disposal problem that compromises our environment, we are producing woodchips and hog fuel for pulp and paper making and green energy production. ", see http://www.ledcor.com/resources/file/Ledcor%20Marine%20and%20Transportation_Media%20Release_30Nov11.pdf

A fibre recovery tenure on Haida Gwaii was awarded to Haida Gwaii Green Diesel but has not been utilized to date by the tenure holder.

A couple of small bioenergy facilities have been established on Haida Gwaii but both currently use externally sourced wood pellets as the fuel input.

- The Village of Port Clements installed a100-kilowatt biomass boiler system that heats the Port Clements multiplex building, fire department and school gymnasium
- Old Massett Village installed a 720-kilowatt biomass boiler, which was commissioned in March 2017, to heat community buildings

In addition, other Haida Gwaii-focused bioenergy related projects have been proposed or are in the planning stages. Examples include but are not limited to the following.

- In 2014, a multi-year BC Hydro renewable energy Request for Expressions of Interest (REOFI) process for Haida Gwaii was terminated but a wide range of proponents submitted a total of 29 renewable energy projects to BC Hydro, several of which featured bioenergy.[88]
- Subsequent to the termination of BC Hydro's Haida Gwaii REOFI process, HaiCo submitted biomass fueled generation proposals to BC Hydro.
- Taan and HaiCo have conducted business planning for a Haida Gwaii wood processing facility that would incorporate a biomass fueled cogeneration unit (pers. comm. D. Cheung 2018).

Financially successful medium- and large-sized sawmills throughout BC convert as much as possible of their wood fibre residues into either revenue streams or into a low-cost energy input for their mill in order to improve overall commercial viability and to comply with BC Government residue disposal requirements. However, this strategy has proven elusive for Haida Gwaii mill operators and initiatives have been either stalled in the planning stages or have not worked out as originally envisioned. The parties behind Haida Gwaii Wood Products set up a wood fibre briquette making plant that opened in 2015 at Port Clements with the intention to utilize residues from its mill as the primary input for manufacturing briquettes, which would be used as a fuel input in local wood combustion energy systems. This briquette making facility was shuttered shortly after opening due to technical challenges in producing the briquettes. The expectation of the Old Masset Village council is that the proposed new partner in Haida Gwaii Wood Products will also participate in funding improvements to and re-opening and operating this briquette plant (pers. comm. D. Edgars 2018).

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[88] The BC Hydro process was pursuant to a Haida Gwaii community electricity plan (CEP) issued by the Council of Haida Nation in 2008, and that was developed with consulting from the Sheltair Group and with the participation of all Haida Gwaii communities, BC Hydro and the Ministry of Energy, Mines and Petroleum Resources (see https://www.bchydro.com/work-with-us/selling-clean-energy/closed-offerings/haida-gwaii-rfp.html?WT.mc_id=rd_hgqci)

Transport cost challenges severely constrain the viability of directing low value hemlock logs from Haida Gwaii to southwest BC pulp mills but pulp log prices are increasing due to pulp log and mill residue constraints in the BC Interior because of the mountain pine beetle induced timber supply reduction and associated sawmill closures. The estimated 700,000 m^3 reduction in Interior BC fibre input sources for coastal BC pulp mills is anticipated to rapidly improve the economics of utilizing coastal BC pulp logs (Girvan 2018).

4.6.4 Haida Gwaii Private Lands Timber Harvest

The viability of Haida Gwaii forest sector enterprises and their employees is a function of the timber harvests on both HGMA lands and private lands

4.6.4.1 Introduction

Although private forested lands are not part of the HGMA, the timber harvest on private lands is an important part of the Haida Gwaii forest sector as the private lands harvest is both a longstanding source of logging, transportation and silviculture employment and a buyer of locally provided goods and services. Haida Gwaii companies that participate in the local forest sector often provide services and goods in connection with harvesting, transport and sometimes processing of both HGMA land and private land timber. From an economic perspective, the underlying viability of the Haida Gwaii forest sector is tied directly into its overall timber harvesting landbase, both HGMA lands and private lands.

The Statistics Canada labour force data collected and compiled as part of the Canada Census does not distinguish between forest industry employment on private lands and public lands. The local labour force data for Haida Gwaii are shown in Section 3.3 and have to be interpreted as characterizing the forest sector labour force residing on Haida Gwaii and that works on both public and private lands.

The largest holding of private lands on Haida Gwaii used for forestry purposes was, prior to 2005, managed as part of TFL 39 and therefore incorporated into the Chief Forester's basis for the determination of TFL 39 Block E's AAC and subject to then applicable land and resource use regulation of public forested lands. The private lands portion of TFL 39 Block E, approximately 10,000 ha, was sold in 2004 by the TFL 39 tenure holder, WFP, to BC Investment Management Co. Albeit these private lands situated near Yakoun Lake are now neither part of the HGMA nor subject to a HGMC AAC determination, past estimates of Haida Gwaii TSA and TFL-based employment would've included employment connected to the timber harvest of these private lands. Subsequent to the sale of these private lands, the new owners and their contractors undertook certain planning activities so the harvest on these lands only started up in earnest in 2007 under the new ownership (about 65,000 m^3 in 2007).

Non-HGMA lands are defined herein as having two parts, Indian Reserves and private lands. The latter is further subdivided herein into two categories of private land based upon their log export regulatory conditions as follows.

- Exportable Crown Grant or federal export jurisdiction private lands[89], which are fee simple private lands that the Crown granted prior to March 12, 1906 and are subject to federal government log export regulation
- Non-exportable Crown Grant or BC provincial export jurisdiction private lands, which are private lands that the Crown granted after March 12, 1906 and are subject to federal government log export regulation [90]

The timber harvest on Haida Gwaii Indian Reserve lands was nominal over the 2008-2017 period.

4.6.4.2 Private land harvest volumes

The total timber harvest on Haida Gwaii private lands is relatively large, averaging 93,476 m^3 per year over the 2008-2017 decade, which equates to 11.3% of the total harvest on Haida Gwaii for this period (826,702 m^3).

Although private land holdings are found in and near the incorporated and unincorporated communities of Haida Gwaii, BC Investment Management Corporation owns the largest tracts of Haida Gwaii private forested lands, amounting to about 10,000 hectares, which are located north and east of Yakoun Lake.

These lands were sold by the Province of BC in 1891 so are categorized as exportable Crown grant lands because they were originally transferred from the BC Government to a private person prior to 1906 and are therefore subject to federal government export regulation.

Excepting 2017, the harvest on federal export jurisdiction private lands on Haida Gwaii was much greater each year over the 2008-2017 decade than the harvest on provincial export jurisdiction private lands. The harvest on the federal export jurisdiction private lands on Haida Gwaii peaked in 2013 at 118,200 m^3, the same year that the total harvest in the HGMA peaked (999,004 m^3). The 2008-2017 annual average harvest on the federal export jurisdiction private lands amounted to 73,531 m^3, almost 80% of the harvest on total private lands (i.e. federal export jurisdiction plus provincial export jurisdiction private lands) on Haida Gwaii. Figure 4-11 shows the Haida Gwaii private lands harvest along with the Crown lands harvest for the 2008-2017 decade.

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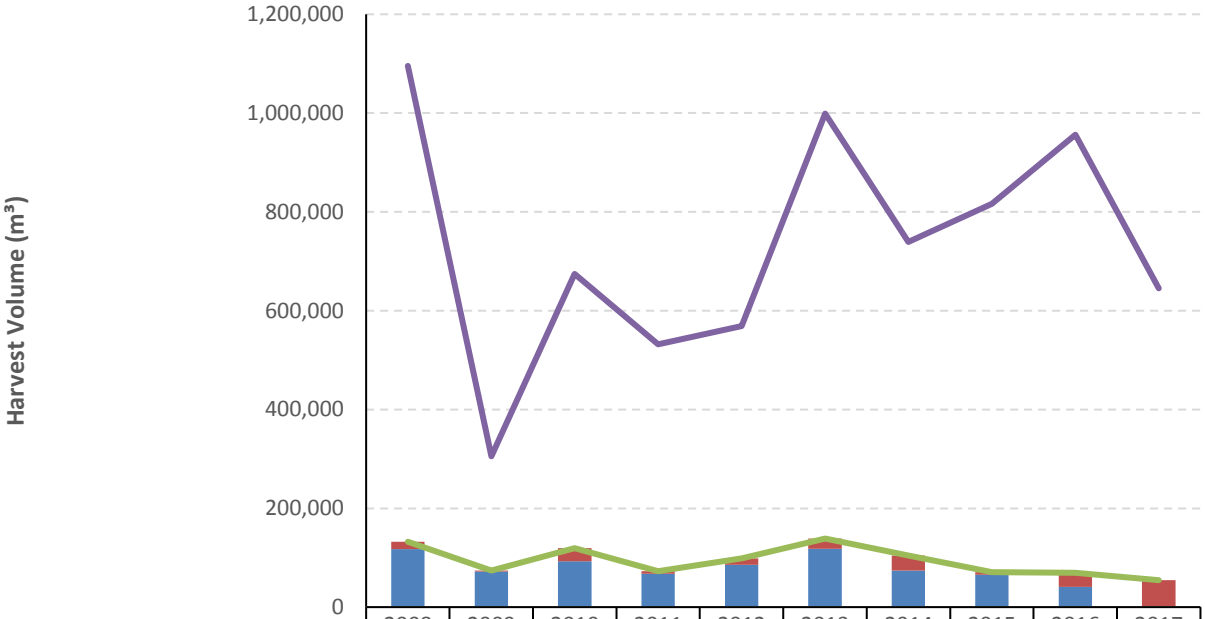
[89] The reference to "federal jurisdiction private lands" pertains to the federal government's jurisdiction over log exports over certain fee simple private lands. These are not federal government lands.

[90] The trigger for this categorization was the reorganization of the regulation of log exports from BC through a new BC Government statute the *Timber Manufacture Act*, which came into effect on March 12, 1906. The new rules applied to timber harvested on Crown lands granted after March 12, 1906, as well as to timber cut on Crown lands.

Figure 4-11: Haida Gwaii Private Lands Timber Harvest (m^3), 2008-2017



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Non-exportable Crown Grant	14,867	1,378	26,854	4,783	13,064	20,616	30,660	5,256	28,453	53,521
Exportable Crown Grant	117,251	72,355	92,791	67,625	85,782	118,200	73,961	65,561	40,779	1,008
Total Private Lands	132,117	73,732	119,643	72,407	98,846	138,817	104,621	70,817	69,232	54,528
Total Crown Lands	1,095,4	305,303	674,687	532,089	568,867	999,004	739,292	816,071	956,417	645,076

Source: Harvest Billing System 2018 and author's calculations

4.6.4.3 Private Lands Timber Harvest by Species

In broad terms, the cedar harvest share of the overall Haida Gwaii private lands timber harvest mirrors the Crown lands situation

Cedar timber accounted for 51.0% of the private lands harvest over the 2008-16 period[91] on what is categorized as the exportable Crown grant or federal export jurisdiction private lands (compared to the HGMA annual average of 48.4%). For the private lands categorized as non-exportable Crown grant or federal export jurisdiction private lands, the annual average of 45.2% was also in line with the average cedar share of the total HGMA harvest.

The cedar harvest share on the federal export jurisdiction private lands peaked in 2010 at 75.9%, and the western redcedar timber share stood at 60.2% in that year, which was also a peak year for the HGMA in terms of its red cedar harvest share.

The hemlock harvest share see-sawed over the 2008-2016 period on federal export jurisdiction private lands from a low of 16.6% in 2010 to a high of 44.1% in 2014. The spruce harvest accounted for a steady share of the federal export jurisdiction private lands harvest, staying within the 10-20% range. The percentage shares by species of the timber harvest on federal and provincial export jurisdiction private lands for the 2008-2017 period are presented in Table 4-8.

Table 4-8: Haida Gwaii Private Lands Timber Harvest Share by Species (%), 2008 - 2017

Species Group	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Annual Average
Federal export jurisdiction/ Exportable Crown Grant Private Land											
Red Cedar	39.6%	42.8%	60.2%	41.8%	53.8%	36.8%	29.3%	55.9%	49.4%	99.7%	41.0%
Yellow Cedar (Cypress)	14.0%	23.1%	15.7%	10.6%	4.7%	11.4%	14.1%	1.3%	5.3%	0.3%	10.0%
Hemlock	35.5%	23.4%	16.6%	32.4%	31.7%	37.8%	44.1%	26.6%	25.5%	0.0%	27.4%
Spruce	10.9%	10.6%	7.5%	15.2%	9.2%	14.0%	12.4%	16.2%	19.5%	0.0%	11.6%
Other Species	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.1%	0.0%	0.2%	0.0%	0.1%
Provincial export jurisdiction/ Non-exportable Crown Grant Private Land											
Red Cedar	39.5%	2.5%	52.1%	42.3%	63.1%	53.1%	50.1%	75.1%	46.4%	27.3%	45.2%
Yellow Cedar (Cypress)	0.0%	0.0%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

[91] 2008-16 was used rather than 2008-2017 to determine the annual average because the 2017 harvest for federal export jurisdiction private lands was much lower than in the other years. The 2017 harvest was much reduced over prior years because BC Investment Management Corporation directed its woodlands operator to much reduce harvesting in the Yakoun area pursuant to a request by the Haida Nation to BC Investment Management Corporation to do so.

Hemlock	32.1%	18.9%	17.0%	32.5%	15.1%	23.3%	26.8%	10.6%	46.5%	12.0%	23.5%
All Species	28.4%	78.6%	30.7%	25.0%	21.8%	23.5%	23.1%	14.3%	7.0%	60.7%	31.3%

Source: Harvest Billing System 2018 and author's calculations

4.6.5 Log Exports

As throughout coastal BC, log export volume from Haida Gwaii has increased markedly over the past decade

Over the 2010-2017 period, exports of Haida Gwaii logs increased sharply both in terms of annual export volume and the share of the total Haida Gwaii harvest. The estimated export share of the total Haida Gwaii harvest went from 13.8% in 2010 to a peak of 42.9% in 2014 and was only slightly lower in 2017 at 41.6%. The Haida Gwaii total export volume peaked in 2015 at approximately 375,000 m^3. The 2017 total Haida Gwaii export volume of about 291,000 m^3 was a 166% increase over the 2010 level (109,552 m^3).

The increase in Haida Gwaii log exports was due to BC-based timber supply factors and demand factors in Asian markets. Between 2004 and 2010, three supply side factors much increased the potential amount of export eligible Haida Gwaii timber as follows.

- The elimination of the manufacture surplus test requirement for Haida Gwaii Crown land and provincial jurisdiction private land timber (see Section 4.5.2) played a role by easing export supply constraints on non-cedar timber.
- The transfer of the private lands of TFL 39 Block E from *Forest Act* and *Lands Act* regulation to *Private Forest Management Land Act* regulation eliminated the TFL AAC constraint set forth by the Chief Forester in relation to the removed private land.
- The removal of the TFL 39 private lands (which were Crown granted pre-1906) resulted in cedar logs harvested from this area becoming eligible for export under the federal government export log regulatory system.[92]

The volume and share of the timber harvest on HGMA lands that was exported climbed from 61,552 m^3 and a 9.1% share of the Crown land harvest in 2010 to 267,873 m^3 and a 41.5% share in 2017. The export of logs from federal export jurisdiction private lands averaged approximately 44,500 m^3 over the 2010-2016 years. Figure 4-12 presents the 2010-2017 trend in log exports from the Haida Gwaii timber harvests on Crown lands, provincial export jurisdiction private lands and federal export jurisdiction private lands.[93]

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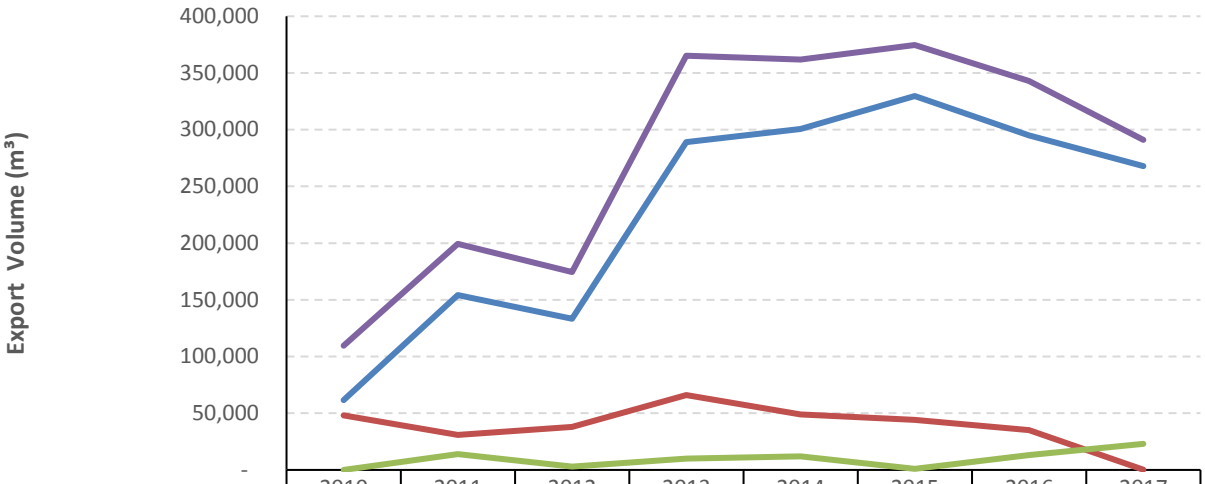
[92] While associated with a TFL, all private land is subject to provincial export log regulation including the restriction on cedar log export despite when it was Crown granted.

[93] Note that these volumes refer to permitted volume, but we can't confirm that all permitted logs were exported, but our understanding is that the vast majority were exported.

Figure 4-12: Log Exports by Export Regulation Jurisdictional Control (m^3), 2010-2017



	2010	2011	2012	2013	2014	2015	2016	2017
Crown lands	61,552	154,217	133,349	289,142	300,726	329,662	295,011	267,873
Federal private lands	48,000	31,000	38,000	66,000	49,000	44,000	35,000	200
Prov. Private lands	-	14,000	3,000	10,000	12,000	1,000	13,000	23,000
Total export	109,552	199,217	174,349	365,142	361,726	374,662	343,011	291,073

Source: Trade and Export Policy Branch of BC MFLNR 2018 and author's calculations

Over the past few years, Haida Gwaii's log export volume share has substantially exceeded the share registered on Coastal BC

In 2017, 267,873 m^3 of Haida Gwaii logs harvested on HGMA lands were exported, which amounts to 41.5% of the HGMA 2017 harvest.[94] Lower value whitewood species account for the vast majority of Haida Gwaii (and Coastal BC) export logs because the BC Government blocks the export of almost any red and yellow cedar logs and higher value whitewood logs. The BC Government does allow for the award of export permits for cedar logs destined for ceremonial or religious uses (incorporation into construction of a religious temple for example). No red or yellow cedar logs harvested on HGMA lands over the 2010-2017 period were given a BC Government export permit.

Over the 5-year 2013-2017 period, the share of log exports in the overall Haida Gwaii harvest averaged 41.7% whereas coastal BC log exports averaged 31.1% over the same period. This 5-year average log export share on Haida Gwaii was reduced because of the big drop in the 2017 timber harvest on federal jurisdiction private lands (due to discussions between the Haida Nation and the owner and managers of these private lands). In 2010, Haida Gwaii

[94] Some of this 2017 export volume will have been harvested in 2016 and some of the 2017 HGMA harvest will be exported in 2018.

exported a much lower share of logs (13.8%) than did the overall coastal BC region (23.6%). Table 4-9 contains a comparison of log exports between Coastal BC and Haida Gwaii.

Table 4-9: Comparison of BC Coastal Log Exports and Haida Gwaii Log Exports, 2010-2017

	2010	2011	2012	2013	2014	2015	2016	2017
Coastal BC total log export (m^3)	3,866,795	5,826,338	5,753,212	6,273,387	6,014,436	5,228,136	6,009,864	5,201,671
Coastal BC total log export as % of total harvest	23.6	30.9	31.6	30.2	31.4	29.5	32.6	31.9
Haida Gwaii total log export	109,552	199,217	174,349	365,142	361,726	374,662	343,011	291,073
Haida Gwaii total log export as % of total harvest	13.8	33.0	26.1	32.1	42.9	42.2	33.4	41.6

Source: HBS, Trade and Export Policy Branch BCMFLNR 2018 and author's calculations

From the supply side, the main factor influencing Haida Gwaii log exports has been the BC Government order-in-council (OIC) that effectively allows for exporting of Haida Gwaii whitewood logs harvested on BC Crown lands and BC private lands in any current year equivalent to 35% of the prior year's total harvest volume (excluding waste volumes) from these BC lands. This OIC came into force in 2010 and is part of the longstanding log export regulation systems at the federal and BC government levels.

Another supply side factor was the sale of the private lands portion of TFL 39 Block 6, approximately 10,000 ha in 2004 by WFP to BC Investment Management Corporation. These lands are pre-1906 Crown grant (or federal) private lands and as such, with the removal of these private lands from the TFL, the new owners were able to export red and yellow cedar logs harvested on these lands. The export volume from these private lands owned by BC Investment Management Co. averaged 44,500 m^3 over the 2010-2016 period.

Strong demand and associated high prices for whitewood logs in China has been the driving force on the demand side. China accounted for 50-60% of BC total log exports over the 2013-2017 period, about 3.6M m^3 per year on average.

Red and yellow cedar logs harvested on pre-1906 Crown grant (or federal) private lands and Indian Reserve lands are not subject to measures preventing their export so these lands comprise the main sources of export volumes of red and yellow cedar logs. However, red and yellow cedar logs account for relatively small portions of BC's total log export volume, for example, 0.7% and 0.1%, respectively, in 2017 because timber harvests on BC Crown and private lands greatly exceed timber harvest amounts on federal private lands and because the BC Government rarely issues export permits for red and yellow cedar logs (Trade and Export Policy Branch BCMFLNR 2018).

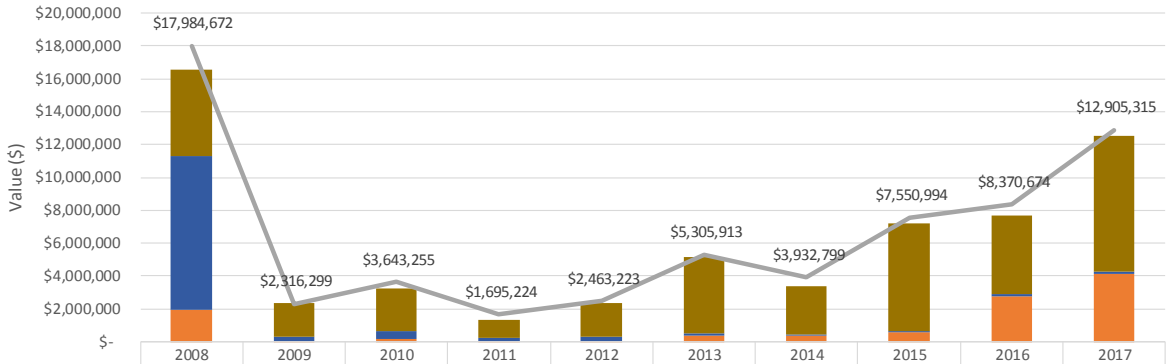
4.7 Stumpage Revenues

Except for the 2008 and 2017 years, the average stumpage revenues per m³ for Haida Gwaii moved up and down within a fairly narrow and low range of $3.19 to $9.25

Figure 4-13 presents stumpage revenues associated with each of the major tenure types and the overall HGMA harvest for the 2008-2017 decade. The BCTS TSL harvest generated 60.8% of the total HGMA stumpage revenues for this decade (but this is not a net figure that takes account of BCTS's costs that other licensees are responsible for). Forest licence stumpage revenues accounted for 17.7% of the HGMA total stumpage revenues over the 2009-2017 period, and TFLs accounted for a 3.5% share of total HGMA total stumpage revenues.

In general, the 2008-2017 trend in Haida Gwaii stumpage revenues followed the trend in the harvest with the 2008 global financial crisis and its aftermath having a strong negative effect on both total harvest volume and total stumpage. The correlation between the two trends is general because the market pricing based stumpage system reflects marketplace sentiments and because the Ministry's approach to applying its calculated stumpage rates has a built in lag of about a year. In some years, the stumpage rate can weigh more heavily than harvest volume on total stumpage revenues as in 2010 and 2016 for example. Another factor affecting Haida Gwaii stumpage revenues is that, except for the beginning and ending years of the 2008-2017 decade, a large portion of the HGMA whitewoods harvest was subject to the $0.25 per m³ minimum stumpage rate.

Figure 4-13: HGMA stumpage revenues by major tenure type ($), 2008-2017



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
SB TSL S20 single mark	$5,257,694	$2,082,094	$2,569,097	$1,064,878	$2,014,667	$4,639,512	$2,967,019	$6,545,240	$4,803,475	$8,258,365
Tree Farm Licence	$9,322,590	$263,370	$514,440	$193,007	$267,130	$123,529	$68,005	$60,053	$113,950	$104,966
Forest Licence	$1,978,678	$31,570	$149,427	$51,458	$51,756	$378,107	$352,018	$592,259	$2,771,759	$4,135,664
HGMA	$17,984,672	$2,316,299	$3,643,255	$1,695,224	$2,463,223	$5,305,913	$3,932,799	$7,550,994	$8,370,674	$12,905,315

Source: Harvest Billing System 2018 and author's calculations

Table 4-10 shows the stumpage revenues per m^3 for the BCTS TSL tenures, TSA 25 and the overall HGMA. The average Haida Gwaii stumpage revenues per m^3 generally tracked the Coastal BC trend over the 2008-2017 decade with the differences on a year by year basis likely due to higher (or lower) Ministry determined red cedar stumpage rates for the Haida Gwaii Forest District relative to the red cedar rates applicable to other Coastal BC districts. .

Table 4-10: Stumpage revenues per m^3 for BCTS TSL (TSA 25), overall TSA 25, HGMA and Coastal BC harvests ($/$m^3$), 2008-2017

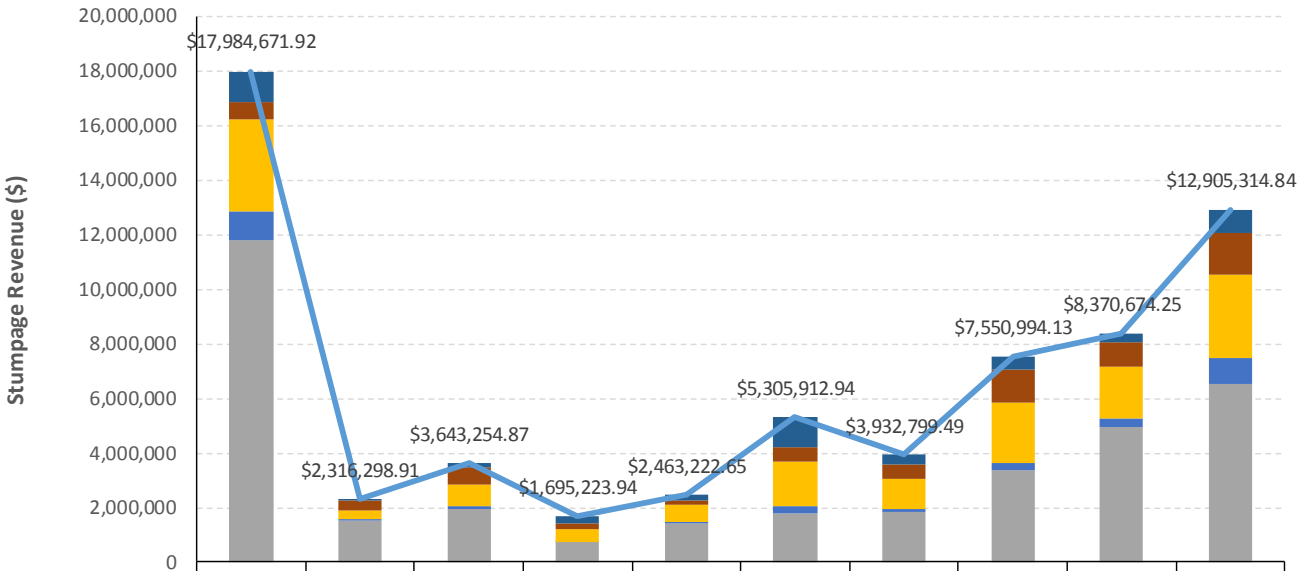
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
BCTS TSL (S20 single mark)	$35.11	$41.71	$23.77	$19.48	$19.53	$22.86	$19.93	$31.43	$33.48	$52.99
TSA 25	$13.73	$11.95	$6.63	$4.32	$4.92	$6.72	$8.09	$13.69	$12.56	$28.18
HGMA	$16.42	$7.59	$5.40	$3.19	$4.33	$5.31	$5.32	$9.25	$8.75	$20.01
Coastal BC	$17.90	$5.50	$4.60	$4.30	$4.20	$6.10	$8.20	$8.50	$12.00	$13.80

Source: Harvest Billing System 2018, author's calculations and BC MFNR 2018e

Over the 2008-17 decade, western redcedar timber accounted for 54% of Haida Gwaii stumpage revenues

From the low point in 2011, Haida Gwaii stumpage revenues, both overall and for western redcedar timber only, climbed steadily reaching a peak of $12.9M and $6.5M, respectively in 2017. Red cedar was 48% of HGMA harvest volume over the 2008-2017 decade, and accounted for 54 % of stumpage revenues. Excepting the 2013 harvest year, the share of red cedar stumpage revenues within all Haida Gwaii stumpage revenues stayed within a narrow band of 43.5% to 66.6%, indicating the relatively substantial importance of this species as a stumpage revenue source on Haida Gwaii. Stumpage revenues derived from harvesting hemlock timber picked up markedly in 2013 and were driven over the 2013-2016 years by an increased hemlock havest volume and in 2017 mainly by a higher stumpage rate. Figure 4-14 presents stumpage revenues by tree species in the HGMA for the 2008-2017 decade.

Figure 4-14: HGMA Stumpage Revenues by Species ($), 2008-17



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Spruce	1,119,628	57,998	157,628	289,459	200,137	1,102,745	357,820	483,381	291,839	848,751
Other Species	638,988	384,483	643,537	193,414	158,031	528,905	516,343	1,239,992	935,183	1,517,765
Hemlock	3,355,323	301,774	812,533	461,798	607,823	1,635,560	1,115,990	2,167,668	1,872,980	3,067,051
Cypress	1,068,852	29,023	91,672	13,468	72,923	229,456	95,702	307,450	312,197	956,340
Red Cedar	11,801,881	1,543,020	1,937,885	737,084	1,424,309	1,809,248	1,846,945	3,352,504	4,958,475	6,515,408
All	17,984,672	2,316,299	3,643,255	1,695,224	2,463,223	5,305,913	3,932,799	7,550,994	8,370,674	12,905,315

Source: Harvest Billing System 2018 and author's calculations

Stumpage revenues per m^3 for Haida Gwaii cedar have been relatively high, especially in 2008 and 2017 but dipped during the 2010-2014 period. Hemlock stumpage revenues per m^3 were pulled along by the bonus bids in BCTS TSL auctions, which reflected high VLM cedar log values and high export whitewood log values over the 2010-2017 period. Table 4-11 shows the per m^3 average stumpage revenues for the HGMA by species over the 2008-2017 decade.

Table 4-11: HGMA Average Stumpage Revenues by Species ($/m³), 2008-2017[95]

Species Group	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Red Cedar	$21.47	$10.41	$5.32	$3.14	$4.90	$4.95	$7.12	$12.10	$12.92	$25.29
Cypress	$10.48	$1.76	$2.52	$0.75	$2.88	$6.45	$5.17	$8.99	$7.17	$21.51

[95] The average stumpage revenues per m^3 are not equivalent to the "average sawlog stumpage rates by species", which is a Ministry calculated and published figure.

Hemlock	$11.01	$3.80	$5.08	$3.24	$3.95	$5.78	$5.37	$8.48	$6.45	$17.89
Spruce	$9.45	$1.13	$1.85	$2.58	$2.66	$4.07	$1.67	$2.28	$1.56	$6.33
All	$16.42	$7.59	$5.40	$3.19	$4.33	$5.31	$5.32	$9.25	$8.75	$20.01

Source: Harvest Billing System 2018 and author's calculations

4.8 Fee in Lieu of Manufacture Revenues

Parties issued a permit to export logs from BC Crown lands must pay a "fee in lieu of manufacture". A schedule applicable to Haida Gwaii logs is included in the BC Cabinet issued order-in-council, the Haida Gwaii Timber Exemption Order, which allows for a proportion of timber harvested on Haida Gwaii Crown lands and provincial jurisdiction private lands, other than red cedar and cypress (yellow cedar) timber, to be "considered surplus to requirements of timber processing facilities in British Columbia" and therefore not subject to the surplus manufacture test (see Section 4.5.2). The applicable fee schedule for Haida Gwaii is as follows.

- 15% of the domestic log values for Douglas fir, all grades
- 10% of the domestic log value for all other coastal coniferous species and grades J and higher, 5% for lower grades of coniferous species other than Douglas fir
- a minimum fee rate of $1.00/m³ where the above fee calculation is less than $1.00/m³
- a fee in lieu rate of $1.00/m³ for deciduous species of timber

The BC Government does not make available data on fee in lieu of manufacture revenues by provincial management units, such as natural resource districts or TSAs. A high level estimate of fee in lieu of manufacture revenues for the HGMA was therefore calculated for this socio-economic report.[96]The annual revenues from this source on Haida Gwaii are estimated to have peaked in 2014 at approximately $1.7 million (within the 2010-2017 period). By way of comparison, stumpage revenues derived from the HGMA in 2014 totaled approximately $3.9 million.[97] The stumpage revenues high point over the 2010-2017 years was $12.9 million in 2017. Table 4-12 presents a high level estimate for 2010-2017 period of fee in lieu of manufacture revenues derived from export logs harvested on Haida Gwaii Crown lands.

[96] The estimate is based on the actual volume by species of export logs harvested on Haida Gwaii Crown lands, average annual VLM prices by species and an average percentage rate applied to the domestic log values that is based on the schedule for determining the fee in lieu of manufacture as stated in the Haida Gwaii Timber Exemption Order. The estimated revenues produced through this calculation approach provide an accurate representation of the scale and trend of these revenues for Haida Gwaii export logs harvested from Crown lands. Additional calculations would be required in order to obtain a more accurate estimate.

[97] Parties exporting logs harvested from Haida Gwaii Crown lands pay the applicable fee in lieu of manufacture in addition to the applicable stumpage amount.

Table 4-12: Estimated fee in lieu of manufacture revenues for the HGMA

	2010	2011	2012	2013	2014	2015	2016	2017
Total Crown lands log exports (m^3)	61,552	154,217	133,349	289,142	300,726	329,662	295,011	267,873
Estimated fee in lieu of manufacture revenues ($)	$250,000	$722,000	$545,000	$1,573,000	$1,720,000	$1,615,000	$1,438,000	$1,387,000

Source: Timber Pricing Branch BC MFLNR 2018, Trade and Export Policy Branch of BC MFLNR 2018 and author's calculations

4.9 Haida Gwaii Forest Sector Operations

4.9.1 Introduction

The Haida Gwaii timber harvest has supported a substantial yet changing forest sector economy. The timber harvest on the islands, which drives the bulk of forest sector revenues, employment and goods and services purchasing, did not change much in response to the reduced AACs introduced in 2012. The average harvest over the 5-year 2013-2017 period was 831,172 m^3. The average harvest over the prior 10-year 2003-2012 period was approximately 780,000 m^3. The forest sector economy has changed however in terms of the main participants both in terms of control of the harvest and the parties undertaking the harvest. The sector also has changed, at least in the recent past, through a lower (overall) level of on Haida Gwaii wood processing, albeit the amount of on Haida Gwaii processing of logs has always been relatively low since the introduction of industrial forestry on the islands. The total volume processed on Haida Gwaii is lower but anecdotal reports suggest that the number of small micro mills and backyard log cutting activity is up over the past few years.

A number of relatively small enterprises on Hiada Gwaii provide a variety of services that help support the ongoing operations of stump to dump logging, forestry management and timber processing. These services include but are not limited to log and cedar block salvage, re-planting, road building, maintenance and deactivation, watershed restoration, block layout, scaling, falling, crew marine transport and road and barge log, equipment, fuel and supplies transport.

In 2011, forest carbon offsets and their associated revenues became a part of the Haida Gwaii forest sector with the creation of a large-scale forest carbon offset project based on the implementation of the Haida Gwaii Land Use Objectives Order (signed December 16, 2010).

In the following sub-sections are short profiles of the main parties engaged with Haida Gwaii harvesting and wood processing, an overview of Haida Gwaii forest carbon offsets and estimates of direct and indirect employment and employment income supported on Haida Gwaii and in BC through the harvesting of Haida Gwaii timber.

4.9.2 Husby Forest Products[98]

Husby has operated continuously on Haida Gwaii since 1985 and controls the largest share of TSA 25's AAC through AAC commitments for its two forest licences (a total of 200,000 m^3, currently 21.5% of TSA/TFL AAC). As well, in recent years, Husby has been one of the main harvesting contractors for the BCIM owned and Islands Timberlands/Mosaic Forest Management managed private lands on Haida Gwaii.[99]

Over the past few years, Husby employees stay on Haida Gwaii during operating shifts and many are permanent residents of the Islands (Morreau 2016).

The predecessor company to Husby Forest Products started out as Husby Trucking in 1970 and then became Husby Allison Trucking and focused on log and gravel hauling in the early years, later expanding into road building. With the purchase in 1985 of CFIP, a Japanese company, which held two Haida Gwaii forest licences and had a camp-based logging operation at Naden Harbour, the company entered into the market logging business and was re-named as Husby Forest Products. The company has since operated continuously on Haida Gwaii and has had the largest share of TSA 25's AAC through its forest licence commitments since the mid-1980s. Until 2011, the Naden Harbour/Eden Lake area formed the operating area on Haida Gwaii for this company. Starting in 2011, the Collison Point area became Husby's main operating area.

In 1997, the company entered the wood processing industry by directing its Haida Gwaii red and yellow cedar logs and a portion of its hemlock and spruce logs to Greater Vancouver located mills for custom cut services. Husby subsequently set up, in 2000, a Delta, BC company, J&G Logworks, to expand this new business. Husby/ J&G Logworks rents log cutting services at four Lower Mainland mills that use Husby/ J&G Logworks milling specifications to convert Husby's logs into wood products as per the orders of Husby/ J&G Logworks's customers, which are mainly wholesalers and lumber remanufacturers. Husby directs its logs to a Lower Mainland mill based on a mill's equipment to process certain types of logs and available capacity. Supplied mainly with Husby's Haida Gwaii logs, the Husby/ J&G Logworks custom milling operation manufactures annually, in recent years, from 60 to 90 million board-feet of lumber products.

Husby was an early entrant into the custom cut niche of coastal BC wood processing. This niche is based on a company directing its own logs, supplemented with purchased logs, to rented BC milling capacity in order to fill custom orders for wood products. Processing of

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[98] Information presented in this section is based on a phone interview and email communications with Rob Sandberg and information sourced from Husby websites and from forest industry publications.

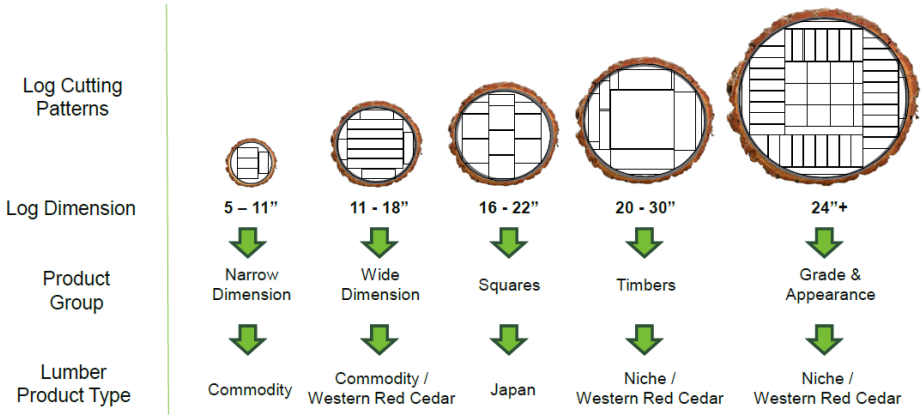
[99] In November 2018, the owners of TimberWest Forest Corporation (BCIM and Public Sector Pension Investment Board) and Island Timberlands (BCIM and Alberta Investment Management Corporation) entered into an agreement to provide for shared use of facilities. Mosaic Forest Management was created to manage this affiliation of the two companies, and is responsible for harvest planning and operations, marketing and sales.

western redcedar logs is the main focus of the coastal custom cutting programs but companies also direct lesser amounts of their spruce and hemlock logs to these contracted mills. The custom cut processing option is now used by several other BC-based operations with timber harvesting rights and no self-owned log cutting or milling facilities. Processing of Haida Gwaii timber is reflective of the relative importance of custom cut programs to milling of Coastal BC timber. Both Husby and O'Brien & Fuerst are longtime operaters of custom cut programs, and Taan implemented a custom cut program soon after taking over TFL 60 from Western Forest Products.

Industrial scale sawmills in coastal BC that provide custom cutting services include but are not limited to the following.

- S&R Sawmills (Surrey, BC), the largest custom cut focused operation in BC, comprising four sawmills and a chip mill, which cuts all Coastal BC softwood species and log sizes. S&R Sawmills says that it can produce approximately 240 different sorts of lumber of different lengths, thicknesses and grades.[100]
- Anderson-Pacific Forest Products Ltd. (Maple Ridge, BC), owned by Canadian Overseas Group
- JCI Touchwood Sawmills Ltd. (Terrace, BC), has a big log mill and a small log mill, which processes western redcedar, yellow cedar, spruce and hemlock logs
- Mainland Sawmill (Richmond, BC) owned by Terminal Forest Products
- Cowichan Lumber Ltd. (North Vancouver, BC)
- Delta Cedar Mill (Delta, BC), owned by Delta Cedar Specialties, focuses on western redcedar decking and siding products

[100] The diverse fibre characteristics of coastal BC by species, age and log size offer a large range of in-demand wood products but also require a range of milling capabilities. The following figure characterizes at a high level how species, log diameter and margin are integrated into the wood product manufacturing decision with coastal BC logs (Western Forest Products 2018).



- Halo Sawmill (Delta, BC), owned by Delta Cedar Specialties, has a big log mill, and focuses on western redcedar decking and siding products
- Stag Timber, (Surrey, BC), owned by Teal-Jones Group

The primary advantages of a custom cut program are that a market logging company's financial resources are not tied up in long-term investments in processing facilities and operations and their logs can be directed to a processing facility based on the facility's milling capabilities and available capacity. The disadvantages of custom cut programs are that they facilitate the concentration of Coastal BC timber processing facilities (and their employment) in the Lower Mainland and mid-Vancouver Island areas and that some wood products milled in a custom cut program have to be sold at a loss because the owner of the custom cut logs does not have inventory or distribution storage space.[101]

Husby has expanded into other business enterprises based on either its operational capabilities or ownership of resource assets.

Husby created a fishing resort from its Naden Harbour logging camp. In 1985, Husby shifted its logging camp from Naden Harbour to a camp at Eden lake, and subsequently opted to develop a corporate retreat fishing lodge for Husby's guests at the Naden Harbour camp location, which opened in 1987. Husby started to market its fishing lodge, named Peregrine Lodge, into the commercial sport fishing market in 1989, and has since further developed it into one of Haida Gwaii's world class fishing resorts.

[101] Larger logs will yield multiple products, a portion of which will have immediate customers, and another portion of a large log's products will require storage awaiting purchase at a suitable price. A mill typically has adjacent or nearby storage space for finished products whereas a market logger using a custom cut program may not have storage facilities for finished products. In this case, some finished products may have to be sold at a loss in parallel with the products that have suitable and timely sales arrangements.

4.9.3 O'Brien & Fuerst[102]

Operating on Haida Gwaii since 1974, Port Clements-based O'Brien & Fuerst has largely focused on logging and road building on the islands. The company acquires TSLs through competing in BCTS's TSL auctions. Over the 2008-2017 period, the company's related parties were awarded an estimated 22 TSLs having a total harvest rights volume of approximately 620,000 m^3 (see Appendix IV).

To a large extent, O'Brien & Fuerst uses its own Haida Gwaii based employees to harvest its Haida Gwaii TSLs. The size of the company's forestry-focused employee group varies based on harvesting activity levels but is typically in the range of 20-25 workers. The company also undertakes forestry road development and maintenance work for other parties on Haida Gwaii.

In the mid-80s, the company entered the wood processing industry by directing its Haida Gwaii cedar logs and whitewood sawlogs to Lower Mainland sawmills for custom cutting of up to three million board-feet per year. The company established a cedar pole processing facility at its Port Clements property in 2002 utilizing fire origin Second Growth cedar timber. At its peak, this operation had an annual production capacity of approximately 12,000 poles, and employed about 12 full-time workers, but was shuttered in 2012 due to a change in the management of the fire-origin cedar area of TSA 25.

The company sells cedar logs, up to 3,500 per year, for log home manufacture. The main customer has been Pioneer Log Homes of Williams Lake, BC, which was featured for several years in the "Timber Kings" reality TV show.

The company acquired a barge and tug to facilitate the transport of its cedar poles, and since has acquired a second barge. These barges are used to transport their logs to the Lower Mainland and Prince Rupert and are contracted out to other parties.

In 1988, an O'Brien & Fuerst subsidiary, O'Brien Road and Bridge Maintenance Ltd., was awarded the contract by the BC Government for year-round maintenance of non-municipal public roads and highways on Haida Gwaii and in the Prince Rupert area (Service Area 27 – North Coast). This company has approximately 20 employees.

[102] Information presented in this section is based on phone interviews with Randy O'Brien, Gloria O'Brien and Travis O'Brien and information sourced from the O'Brien & Fuerst website and from forest industry publications.

4.9.4 Taan Forest Products[103]

A relatively new Haida Gwaii forest sector operator, established in 2010, Taan Forest Products Ltd. was created as a division of HaiCo to manage Haida Nation logging interests. Taan has quickly grown and now controls the largest share of the Haida Gwaii AAC, holding commitments under BC Government awarded tenures for approximately half of the Haida Gwaii AAC. In September 2010, Taan and BC Timber Sales (BCTS) signed a Cooperative Management Agreement to manage approximately 14,000 m^3. In 2011, Taan Forest Products Ltd. began to manage TFL 60, assuming the TFL management responsibilities formerly handled by WFP, and in June 2012, Taan completed the purchase of TFL 60 from WFP (Taan 2016).

To date, Taan has participated in on and off Haida Gwaii timber processing. Taan undertook a joint venture with Skidegate Band Council in a cedar pole peeling plant at Ferguson Bay from 2012 thru late 2016 that was supplied with fire origin Second Growth cedar logs. Taan has operated a custom cutting program using Lower Mainland sawmills to process its Haida Gwaii cedar logs and also some of its whitewood logs. The company has also utilized a few Haida Gwaii micro mills, such as Tanu Wood Products and Eaglecrest Enterprises, to fill small custom cut orders for wood products such as bridge timbers. Starting in 2012, Taan had an agreement with Haida Gwaii Wood Products (HWWP) to supply logs on commercial terms to HWWP's Port Clements mill. However, little fibre was directed to this mill by Taan due to HWWP's operational challenges in recent years. At the time of this report's preparation, HWWP is in the midst of negotiating both a new log purchasing agreement with Taan and an ownership re-structure that will lead to a resumption of operations in 2019 of HWWP's Port Clements mill.

Taan has undertaken planning for a new Haida Gwaii timber processing facility that would be supplied through a re-direction of a portion of Taan's logs from its Lower Mainland-based custom cut program.

Consistent with HaiCo's strategic plan, Taan strives to strike a "…balance between managing the forest resources entrusted to us, providing well-paying jobs and running a profitable business".[104] Taan uses public RFPs and associated evaluation criteria to emphasize Haida Gwaii presence and experience in selection of its contractors.[105] Taan's focus on securing a

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[103] Information presented in this section is based on phone interviews with Jeff Mosher, Bill Crocker and Dave Cheung of Taan and information sourced from the HaiCo and Taan websites and from Taan and HaiCo publications.

[104] See https://www.taanforest.com/our-team

[105] For example, Taan used the following criteria and weighting in a RFP to secure a logging contractor. Local employment - 25% (15% local Haida Gwaii, 10% Haida Ancestry), local ownership of company - 15%, machinery to conduct work - 25%, ability/ Experience to complete work - 20%, past performance with Taan - 10%, and hourly rates - 5%

high proportion of Haida Gwaii representation or content in its employment, contracting and goods and services purchases has resulted in a high percentage of its employees, contractors and suppliers being sourced from Haida Gwaii. In 2017, Taan estimates that 91% of its logging contractors are based in Haida Gwaii and that 65% of Taan employees are Haida Gwaii residents.[106] Employees of Taan contractors account for the larger share of Taan's direct workforce. The following table shows, for the 2011-2017 period, the percentage share of logging phase contractors engaged and of employees hired by Taan who are Haida Gwaii-based.

Table 4-13: Haida Gwaii share of logging phase contractors engaged and employees hired by Taan, 2011-2017

	2011	2012	2013	2014	2015	2016	2017
Share of total Taan contractors with Haida Gwaii based operations (%)	89%	89%	91%	80%	91%	94%	91%
Share of total Taan employees who are Haida Gwaii residents (%)	43%	73%	93%	80%	71%	75%	65%

Source: Taan Forest Products Ltd. 2018

The following table shows the number of Taan suppliers having Haida Gwaii operations and the percentage share held by suppliers having Haida Gwaii operations of Taan's total spend on goods and services over the seven-year 2011-2017 period. As Taan's operations have expanded so too has its base of suppliers, but the company has managed to sustain a Haida Gwaii share of this supplier base in terms of the total spend in the 50-60% range.

Table 4-14: Taan suppliers having Haida Gwaii operations, 2011-2017

	2011	2012	2013	2014	2015	2016	2017
# of local vendors	35	59	53	77	75	80	89
Haida Gwaii share as % of Taan's total supply spend	52%	51%	57%	59%	63%	48%	54%

Source: Taan Forest Products Ltd. 2018

4.9.5 A&A Trading (Haida Gwaii) Ltd. [107]

A&A purchased TFL 58 and FL A16870 in December 2016 from Teal Jones Group. A&A is a well-established coastal BC forestry company, operating for more than 30 years and managing current harvesting operations in the Nootka Sound, Sunshine Coast, Powell River, North Coast and Mid-Coast areas, as well as on Haida Gwaii. For the past decade, A&A has established business relationships with several Coastal BC First Nations, and the company is an active member of the province's major forest industry association, BC Council of Forest Industries (COFI).

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[106] Haida Gwaii residents or permanent residents are defined here as persons who have their principal residence on Haida Gwaii.

[107] Information presented in this section is based on a phone interview and email communications with Marty Locker and information sourced from the A&A website and from forest industry publications.

A&A's broad operational parameters on Haida Gwaii differ from the approaches used by Teal Jones Group in that A&A largely relies on contractors (rather than company employees) to undertake timber harvesting and A&A sells its Haida Gwaii logs to wood processing operations or to log buyers in both the Lower Mainland and in Asian export markets (whereas Teal Jones Group primarily directed its Haida Gwaii logs to its Surrey, BC sawmill). In general, A&A intends to focus its Haida Gwaii operations on whitewoods log export sales and contract sales of cedar logs and hemlock pulp logs into the Lower Mainland.

A&A has contracted Sandspit-based CNR to be its stump to dump contractor.[108]

Since acquiring the Haida Gwaii tenures in December 2016, A&A has done (up to late 2018) only a limited amount of Haida Gwaii harvesting (a Timberwest TL and a purchased private property) and focused on upgrading the infrastructure of its TFL.

A&A has engaged with local micro mills in order to communicate A&A's willingness to sell cedar fibre to local wood processers.

4.9.6 Silva Services / Timo Johnsson Contracting[109]

As mentioned in Section 4.6.3, several Haida Gwaii based enterprises engage in salvage logging. Silva Services is a longtime operator in this niche but the company and the owner, Timo Johnsson, offer an example of a Haida Gwaii small business that provides or has provided a few forest sector services over a long period of time. Other similar examples of these small longtime forest sector operators are present on Haida Gwaii so an overview of Silva Services follows but this should be seen as representative in only a broad way of other small Haida Gwaii forestry enterprises.

Johnsson started as a silviculture contractor with a crew of about a dozen workers on Haida Gwaii in the late 1970s doing juvenile spacing, spending April through October on Haida Gwaii and working in other areas of BC as well. In the early 1990s, he began to undertake salvage of logs (mainly cedar), cants and shake bolts on the islands, contracting to Western Forest Products and other tenure holders. In the early years, this salvage included using helicopters to transport cedar blocks or cants to the roadside for trucking to beach sites for loading logs on barges. A somewhat smaller operation now, Silva is still in the salvage business and uses a survey crew to identify suitable sites in blowdown areas and old cutblocks as well as buckers and fallers in the salvage operations. At this time, Silva sells cants, logs and shake bolts into the VLM for the most part, and the salvaged fibre is delivered to a beach site where the buyer assumes responsibility for transport to the Lower Mainland. Silva sells some cedar blocks and cants to a few local micro mills when there is a demand for such.

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[108] Taan also uses CNR (for logging on Moresby and Louise Islands) as one of its two current Haida Gwaii stump to dump contractors.

[109] Information presented in this section is based on an interview with Timo Johnsson and information sourced from forest industry publications.

Johnsson purchased a small mill at Alliford Bay from MacMillan Bloedel in the mid 1990s when this major operator left Haida Gwaii. The mill was in business for about a dozen years and closed in 2008. Annual log consumption amounted to about 2,000 m^3 of logs, with daily one shift production of 1,500 board feet and 360,000 board feet annually over a season of approximately 210 days. The milling operation employed 3 to 5 workers. The fibre supply was sourced from the major TFL operators, Weyerhaeuser and WFP, and from salvage sales through BCTS.

In 2010, Johnsson began contracting excavator services to Taan, performing road maintenance and dryland sort cleaning and watershed restoration, including road deactivation, removing wooden culverts, pulling back old landings and sloping roads. Johnsson also has a contract to remove contaminated soils from an old fuel storage site at a Lousie Island logging camp.

Johnsson also acquired a barge for transporting salvaged cedar shake bolts from remote locations but also now transports logging equipment.

At this juncture, the full-time (10 months) crew comprises four workers (including Mr Johnsson) plus three part-time crew members working about 100 days per year.

4.9.7 Wood Processing Enterprises

Four categories or types of wood processing enterprises have been (or are currently) present on Haida Gwaii:

- small, multi-species mills,
- cedar pole peeling plants,
- 1 to 5 person operated micro mills, and
- "backyard" timber cutting units.

Each of the largest Haida Gwaii focused timber harvesting operators, Husby, O'Brien & Fuerst and Taan, have fairly large custom cutting programs in which they rent capacity/services at Lower Mainland sawmills in order to process their Haida Gwaii harvested logs (mainly cedar logs) (which are described in Sections 4.9.2, 4.9.3 and 4.9.4).

Haida Gwaii Forest Products[110]

The only small, multi-species mill on Haida Gwaii is Haida Gwaii Forest Products (formerly Abfam Enterprises Ltd.) in Port Clements. HGFP was started by Jim Abbott, a long-time Haida Gwaii resident, but in 2015 the Old Massett Village Council became a joint venture partner in this operation. This Port Clements mill has been inactive since mid-2017.

The Port Clements mill has a total production capacity of an estimated 12 million board-feet, six million board-feet for cedar and six million for whitewoods and is a head rig mill with 2 lines and has a kiln and planers.

In recent years, the owners have purchased logs to supply the facility but the company had a 10-year non-renewable 40,000 m^3 per year licence from the mid-80s through the mid-90s, which was the basis for establishing the Port Clements facility and supported a decade of steady mill production and employment. The owners have secured four TSLs at BCTS auctions but have expressed concerns many times over the years about unsatisfactory access to fibre and cost of fibre to feed its mill.

Average annual employment at the Port Clements mill over the 3-year 2015-17 period amounted to an estimated 6 full-time workers and 18 part-time workers.

O'Brien & Fuerst and Taan Forest Products

O'Brien & Fuerst have a shuttered cedar pole peeling plant on their Port Clements property (see Section 4.9.3). The pole peeling facility owned and operated by Taan and Skidegate Band Council at Ferguson Bay between 2012 and 2016 has since been dismantled and sold (see Section 4.9.4).

Micro Mills[111]

Micro mills have been a longstanding feature of Haida Gwaii wood processing activity. For example, a directory of Haida Gwaii forest sector focused enterprises published in 1999 listed 14 micro mills (Kellie and Associates 1999). A few of the owner-operators on this 1999 list operate a Haida Gwaii micro mill today (albeit in a different configuration). These mills are business enterprises but the owner-operator typically also has one or two other business activities underway on a part-time or seasonal basis as well. The fibre consumption of these micro mills is in the annual range of 200 m^3 to 2,000 m^3 depending on the milling equipment and the timber supply sources of the owner-operator. The processing configuration of these

[110] Information presented in this section is based on interviews with Randy Friesen, Rhonda Abbott, Danny Abbott, and Duffy Edgar and information sourced from forest industry publications.

[111] Information presented in this section is based on interviews with Art Pearson, Jean-Marc Cyr, Tim Fennell and Timo Johnsson, email communications with other Haida Gwaii residents, information sourced from forest industry publications, and internet searches.

micro mills varies; Eaglecrest Enterprises is an example of a longstanding Haida Gwaii micro mill operator and its current operation includes a circular mill and a bandsaw mill, plus an edger, a kiln and a moulder at the industrial park in Port Clements.

Western redcedar is the main milled tree species. The customers of the Haida Gwaii micro mill are primarily local businesses (such as fishing lodges), organizations (such as community halls) and residents (new homes and renovations), and generally these small mills will offer custom cut services as well as mill their own logs and sell the resulting products. Taan appears to be the only Haida Gwaii licensee utilizing these local micro mills. Taan has contracted a few local micro mills to fulfil small, custom cut orders (such as producing bridge timbers). A few of these micro mills make some off islands sales of specialty wood products, such as timbers for new residences.

In addition to the owner-operator these micro mills hire 1 to 5 workers when they are operating.

The current enterprises and Haida Gwaii locations in the micro mill wood processing category include (but are not limited to) the following.[112]

- Lawnhill Sawmill (Queen Charlotte)
- Jean-Marc Cyr (Sandspit)
- Eaglecrest Enterprises (Port Clements)
- Tanu Wood Products (Skidegate)
- Lagace Lumber (Queen Charlotte)
- Pinneault Welding and Fabricating (Queen Charlotte)
- Brasier Mill (Masset);
- Chown River Mill (Masset); and
- Moonlight Milling (Sandspit).

In addition to these micro mills, several parties on Haida Gwaii have small band saw and circular saw machines (such as Wood-Mizer units) on their residential property that they use for processing their own harvested timber and acquired logs into wood products (decking and siding panels for example) for personal use and for sale to other local residents. As well, these "backyard" log sawing units are also used to custom cut logs owned by other local residents.

[112] Based on anecdotal and published sources, such as business websites and community website business directors. Other micro mills may be present on Haida Gwaii in addition to the ones named herein.

4.9.8 Forest Offset Credits

The contraction of the Haida Gwaii THLB through creation of new protected areas led to the creation of a Haida Gwaii forest carbon project and the monetization of the forest carbon storage services of the new protected areas

The Haida Nation is part of the Great Bear Initiative Society, an umbrella group of Coastal BC First Nations, which enables the First Nations to discuss and engage in matters that are relevant for a larger region within the Great Bear Rainforest. This organization has been working together on the land use planning decisions that were enacted along the coast and is the proponent of the Great Bear Forest Carbon Project. The overall Great Bear Forest Carbon Project was developed as three separate projects, including a Haida Gwaii project (entitled "Great Bear (Haida Gwaii) Forest Carbon Project").

In 2011, forest carbon offsets and their associated revenues became a part of the structure of the Haida Gwaii forest sector with the creation of a large-scale forest carbon offset project based on the implementations of the Haida Gwaii SLUA and the Haida Gwaii LUOO (Offsetters 2013). The SLUAled to the creation of several additional protected areas (conservancies) on Haida Gwaii and the LUOO led to the establishment of special management areas to address a range of EBM objectives (such as cultural western redcedar and northern goshawk conservation objectives). Although Haida Gwaii's THLB and AACs contracted as a direct result of these measures, a large annual stream of approximately 400,000 carbon credits was created through this forest carbon offset project that was premised on a reduced timber harvest (and increased carbon storage) compared to the likely timber harvest in the absence of the new conservancies and special management areas.

The original arrangements set up between the Province of BC and coastal First Nations to facilitate the creation and sale of coastal BC forest carbon offsets have since been refined and expanded and now include the following.[113]

- "The Atmospheric Benefit Sharing Agreement, re-negotiated in 2016 with the Province of British Columbia, which allows Coastal First Nations to use atmospheric benefits for socio-economic gain" and the 2019 Haida Nation Indigenous Atmospheric Benefit Agreement
- "The Offset Purchase Agreement, signed in 2015, which allows for the purchase of 2.89 million tonnes of carbon credits over six years" (by the Government of BC)
- "The Carbon Credit Transfer Agreement, signed in 2016, which authorizes the Great Bear Carbon Credit Corporation to market and sell carbon credits"

[113] See http://greatbearcorp.ca/subsidiaries/great-bear-carbon-credit-corporation/

- "The Great Bear Initiative Society Atmospheric Benefit Sharing Agreement, signed in 2016, which allows the proceeds from the sale of a portion of additional carbon credits to benefit land and marine use projects"

Under the Atmospheric Benefit Sharing Agreements between the BC Government and coastal First Nations, the carbon offsets from this Haida Gwaii forest carbon project are split between the BC Government (approximately 20%) and Haida Nation (approximately 80%). The Great Bear (Haida Gwaii) Forest Carbon Project is expected to generate approximately 12 million carbon offsets (or tonnes of CO_2e emissions reductions) over a 25-year project period. Annual volumes of carbon offsets are expected to range from approximately 300,000 to a maximum of 584,000 (Offsetters 2013).

The primary buyer of these Haida Gwaii offset credits at this juncture is the BC Government, which is using these credits to assist in meeting the compliance objectives of the Carbon Neutral Government Program.[114] The acquisition of these Haida Gwaii offset credits is publicly reported on an annual basis by the BC Government. In 2016, this Haida Gwaii based offset project sold 276,258 offset credits to the BC Government at a price of $12 each for total proceeds of $3,315,096 (BC Ministry of Environment and Climate Change Strategy 2017).[115]

Purchases of Haida Gwaii forest carbon offsets may qualify for compliance use by regulated entities seeking qualifying offset credits in order to assist with their compliance with the Government of Canada's Federal Carbon Pollution Pricing System (which had a January 1, 2019 start date). If these Haida Gwaii offset credits are approved for sale into this marketplace then they are likely to capture a higher price than the above reported $12 (per offset credit) because these offset credits will be acquired by regulated GHG emitting entities at a small discount to the compliance price (i.e., the Carbon Levy).[116]

4.10 Forest Sector Employment

4.10.1 Timber Harvesting Employment Estimates

Both timber harvesting and wood processing employment of Haida Gwaii residents declined since the early 2000s

[114] Legislated under the Climate Change Accountability Act (formerly the *Greenhouse Gas Reduction Targets Act*) and the Carbon Neutral Government Regulation

[115] This total is a gross figure and is shared on an 80:20 basis between the Haida Nation and the Government of BC. In addition, annual administrative and management costs are associated with the offset project's operation and need to be netted out of the gross to arrive at net proceeds.

[116] The federal government's Carbon Levy will apply to regulated emitters use of prescribed liquid, gaseous, and solid fossil fuels at a rate that is equivalent to $10 per tonne of CO_2e in 2018, increasing annually, until it reaches $50 per tonne of CO_2e by 2022.

Estimated Haida Gwaii associated forestry employment, based on surveys of Haida Gwaii industry participants, shows a decline in the 2015-17 period over the 2002-04 period due to a lower average harvest, greater log export volume and higher logging productivity in the more recent period. Haida Gwaii residents had a higher share of Haida Gwaii direct harvesting employment however in the more recent 2015-17 period, an estimated 81% vs 60% in 2002-04, which is largely due to Taan's employment and contracting practices.

The scale of Haida Gwaii's available annual cut per capita within the context of a small population and labour force underlies the basis for the forest sector occupying a prominent position in the Haida Gwaii economy. The broad factor that has generated the bulk of the forest sector employment opportunities on Haida Gwaii is the demand in certain external markets for Haida Gwaii logs (as described in Section 4.3). An indication of the importance of log market demand conditions compared to timber supply conditions is that the average annual harvest in the 5-year 2013-17 period was much higher (831,172 m^3) when a lower AAC has been in effect compared to the 635,280 m^3 average annual harvest in the 5-year 2008-12 period when the sum of the TSA and TFL AACs (representing the maximum potential commercial timber supply) was much higher but also when market demand factors such as the 2008 financial crisis were in play.

The average annual timber harvesting direct employment supported by the HGMA timber harvest for the 2015-2017 period was an estimated 270 PYs for Haida Gwaii resident workers. In addition to the direct employment in undertaking harvest planning, cut block layout, falling, yarding, truck and marine transport and several other harvest related activities, the HGMA timber harvest supports indirect employment, which arises from the purchases of goods and services by forest industry companies (an example would be the purchase of fuel by a stump to dump logging contractor) and induced employment, which arises through the purchasing of goods and services by the households of forest industry employees, an example would be their grocery purchases.

Another 122 PYs of indirect and induced employment on the islands was supported through the HGMA timber harvest, and a total annual average employment impact on Haida Gwaii of 392 PYs.

The direct employment effect in the overall province of harvesting HGMA timber is an estimated annual average of 333 PYs. The incremental difference of 63 PYs between the Haida Gwaii and provincial impacts is accounted for by the workers who work on Haida Gwaii but have their permanent residences elsewhere in the provice. Including the indirect and induced employment supported by HGMA timber harvesting along with the direct employment estimates yields a total employment effect of an annual average of 663 PYs in the province for the 2015-2017 period.

Table 4-15 presents estimates of the annual average employment over the 2015-2017 period supported by the HGMA timber harvest, including a breakdown by broad harvesting related activity. Direct employment is reported as an annual average estimate and as the intensity of

direct employment in person-year units (PYs) per '000 m^3 of harvested timber. The intensity figure is reported as a co-efficient, which is used to calculate potential direct employment effects based on levels of timber harvesting activity. The annual average employment levels and direct employment co-efficients are reported at the Haida Gwaii and BC levels.

Table 4-15: Estimated average annual employment impacts for Haida Gwaii workers and in the province that is supported by harvesting HGMA timber, 2015-2017

HGMA annual avg. harvest (m^3)	805,854			
Activity	**Haida Gwaii**		**BC**	
	Employment (PYs)	**Employment Co-efficient[117] (PYs/'000 m^3)**	**Employment (PYs)**	**Employment Co-efficient (PYs/'000 m^3)**
Direct employment				
Harvesting	206	0.256	255	0..317
Log transport	20	0.025	27	0.033
Road construction & maintenance	28	0.034	35	0.044
Silviculture	16	0.020	16	0.020
Total direct employment	270	0.335	333	0.414
Indirect/induced employment[118]	122	1.42 (total multiplier)	330	1.99 (total multiplier)

[117] The direct employment co-efficients are calculated from data obtained through a survey of tenure holders undertaken for this socio-economic project. The survey respondents supplied data for the 2015-2017 period. The employment estimates based on using these co-efficients reflect the standard practices used by public sector entities for estimating forest sector employment in BC but the shown figures should not be interpreted as precise estimates to single digits. The estimates are considered to be accurate (and reliable for policy-making purposes) because the underlying basis for them are actual results reported by tenure holders and actual invoiced timber harvest data. A reasonable way to view the accuracy of the estimates is to view them as accurate within $\pm$ 5% so, on this basis, direct Haida Gwaii harvesting employment associated with the HGMA harvest could be between 284 PYs and 256 PYs.

[118] The total multipliers used to estimate indirect and induced employment are the ratio of total employment to direct employment. Total employment is the sum of direct + indirect + induced employment. The shown BC total multiplier for "forestry and logging" is based on detailed industry data extracted from the BC Input-Output Model (BCIOM), which is maintained by BC Stats to analyze project and program spending in the province. This model has data by industry for employment, employment income, gross domestic product, economic output, and government taxation revenues in BC. While use of the BCIOM has limitations, its commodity and industry relationships are based on a very large database accumulated over several years and the model has been found to generate effect estimates that are indicative of realized economic effects. As well, the total multipliers for BC calculated for use in this socio-economic report incorporated direction on their construction as outlined in a BC Stats publication (Horne 2004).

The Haida Gwaii area multipliers were sourced from a research project commissioned by BC Stats that developed economic multipliers by key industries for small areas throughout the province (Horne 2009a). Although the Haida Gwaii multipliers are based on 2006 Census of Canada data, they are considered to be relevant although they likely understate more recent indirect and induced effects connected to Haida Gwaii harvesting activities. This observation about understing indirect and induced effects is based on the noted higher level of Haida Gwaii residency of timber harvesting workers so more household spending is expected for the 2015-2017 period versus 2006 resulting in higher induced employment effects. As well, Taan did not operate in and around 2006 as noted in Section 4.9.4, and this company has made a concerted effort to use local suppliers of goods and services so indirect employment connected

Total employment	392		663	

Source: survey of HGMA tenure holders and author's calculations

To help determine the residency of forest industry workers, tenure holders were asked to supply basic information about the "usual place of residence" (i.e. permanent residence) of their own employees and of the employees of their contractors (such as a stump to dump contractor).[119] Based on the survey information, an estimated 81% of Haida Gwaii timber harvesting related employment during the 2015-2017 period resided on Haida Gwaii. This level of Haida Gwaii residency of timber harvest employment for the 2015-2017 period is substantially higher than the level of 60% for the 2002-2004 period, which was recorded the last time that a survey of the harvesting related employment of Haida Gwaii forest tenure holders was undertaken (Pierce Lefebvre Consulting 2005).

A Haida Gwaii residency level of 81% for the workforce harvesting HGMA timber is characterized herein as a high level because specialist work is required for certain aspects of timber harvesting, such as archaeology and tree falling, and because the Haida Gwaii population and labour force are small (compared to other areas and communities in BC and in relation to the Haida Gwaii AAC). In certain specialist fields, firms based in larger centres, such as North Vancouver and Nanaimo, contract their services throughout the coastal BC forest industry. In regard to the Haida Gwaii population of labour force relative to its AAC, for context here, the ratio of the Haida Gwaii AAC to its population can be compared against the ratio for the province or another major timber harvesting region. The AAC volume per capita on Haida Gwaii is relatively substantial, an estimated 222 m^3 per person, much higher than the average AAC volume per capita in BC of approximately 16 m^3/person.

The main factor that underlies the increase in the Haida Gwaii share of Haida Gwaii timber harvesting direct employment is the creation of Taan Forest Products and its policies and actions to use local workers and local supplier businesses to harvest its tenures as much as possible within the constraints of finding suitably qualified workers and businesses (see Section 4.9.4).

to HGMA timber harvesting effects are likely higher in the 2015-2017 period than in 2006. And induced employment would also be slightly higher as it is based on spending by the households of both direct and indirect workers. From a structural standpoint, the Haida Gwaii service sector was not marked by large additions or deletions between 2000 and 2016 so the basic or structure make-up of the local service sector was similar over this period. The shown annual average indirect and induced employment estimate for Haida Gwaii could be up to about 20% higher as a result of the described situation.

[119] Usual place of residence is a Statistics Canada term, and refers to the community of a person's long-term home or permanent residence. Long distance commuting occurs on Haida Gwaii and elsewhere in Canada so long distance commuters can have both a place of work residence and a usual place of residence. We are interested in distinguishing between Haida Gwaii forest industry workers who have their permanent residence on Haida Gwaii and those who have their permanent residence elsewhere.

The forest sector employment estimates include neither BC MFLNR employment nor BCTS employment on Haida Gwaii.[120] A considerable number of forest/natural resource districts and forest/natural resource district offices have been consolidated across the province but Haida Gwaii has retained its own administrative district and district office. Over the 2015-2017 period, BC MFLNR has maintained an average annual staffing level of 22 full-time employees and 1 to 4 part-time employees in its Haida Gwaii office. Within this BC MFLNR total staff level are 4 to 5 BCTS staff positions (pers. comm. T. Johnson 2018). Table 4-16 shows MFLNR's Haida Gwaii office employment for the 2015-2017 years.

Table 4-16: Haida Gwaii MFLNR employment including BCTS staffing, 2015-2017

Year	Full Time	Part Time
2015	23	1
2016	22	1
2017	21	4

Source: pers. comm. D. Sherban 2018

The estimated direct employment supported by the HGMA (i.e. Crown lands) timber harvest declined from an annual average of 578 PYs in the 2002-2004 period to the level of 333 PYs during the 2015-2017 years on a province-wide basis (and from 349 PYs of Haida Gwaii resident workers to 270 PYs of Haida Gwaii resident workers). The decline between these two time periods, separated by a dozen years, was due to a lower harvest level and to higher logging productivity (i.e. fewer PYs/m³ harvested) in the more recent time period. Haida Gwaii residents had a higher share of Haida Gwaii associated timber harvesting direct employment in the more recent 2015-2017 period, 81% versus 60% in 2002-04. Table 4-17 presents a comparison of the annual average harvesting related direct employment supported by the HGMA lands timber harvest during these two time periods.

Table 4-17: Comparison of HGMA timber harvesting related direct employment during 2015-2017 versus 2002-2004

	2015-2017	2002-2004
HGMA annual avg. harvest (m^3)	805,854	1,037,193
BC employment co-efficient (PYs/'000 m^3)	0.414	0.557
Haida Gwaii employment co-efficient (PYs/'000 m^3)	0.335	0.337
Other BC employment co-	0.079	0.220

[120] BC MFLNR and BCTS employment are not included as part of direct forest industry employment because they are directly related to the Ministry's administration and statutory roles and responsibilities. As mentioned in Section 3-4, BC MFLNR employment is categorized in Statistics Canada's labour force and employment data under "public administration" and not under a forest sector industry category.

efficient (PYs/'000 m^3)		
Annual avg. employment in BC (PYs)	333	578
Annual avg. employment of Haida Gwaii workers (PYs)	270	349
Annual avg. employment of other BC workers (PYs)	63	229

Source: survey of HGMA tenure holders, BC MFLNR 2018; Pierce and Lefebvre Consulting 2005; and author's calculations

4.10.2 Wood Processing Employment Estimates

4.10.2.1 Employment Estimates for Processing of Haida Gwaii Logs on Haida Gwaii

The amount of wood processing direct employment on Haida Gwaii supported by the HGMA timber harvest is estimated to have been relatively modest during the 2015-2017 period, an annual average of approximately 15 PYs[121]

The current status of the Haida Gwaii wood processing industry is laid out in Section 4.9.7. The annual average estimated direct employment level of the Haida Gwaii wood processing operations for the 2015-2017 period of 15 PYs is a decline from the estimated amount of 54 PYs in the earlier 2002-2004 period (Pierce Lefebvre Consulting 2005). The structure of the local wood processing industry did not fundamentally change between these two periods as during both time periods a small sawmill operated in Port Clements and approximately a dozen micro mills were located in the main communities of the islands. The main differences between the two time periods in terms of the number and type of processing operations was the downsizing of the Abfam/HGWP mill in Port Clements and that O'Brien & Fuerst operated a small pole peeling facility at Port Clements and Timo Johnsson operated a larger micro mill at Sandspit during the earlier time period (but not during the 2015-2017 years). The difference in local processing employment between the two time periods was due to the Haida Gwaii mills processing, in aggregate, a larger amount of timber, an estimated annual average of approximately 55,000 m^3, in the earlier time period versus an estimated annual average of approximately 3,000 m^3 during the 2015-2017 period.[122] More Haida Gwaii timber

[121] The estimate of 15 PYs is based on employment and timber input data for the 2015-2017 period provided by Haida Gwaii Forest Products and interviews with a few of the operators of small Haida Gwaii micro mills. A majority of these PYs are based on persons working part-time in wood processing so the number of workers in wood processing is greater than 15.

[122] The total timber throughput of Haida Gwaii processing facilities was estimated as approximately 37,000 m^3 for local sawmills and another 20,000 m^3 for local shake and shingle production (Pierce Lefebvre Consulting and D.A. Ruffle & Associates 2003).

got milled locally in the 2002-2004 time frame because of the presence of the aforementioned Port Clements pole peeling plant and the Sandspit mill and because the Abfam/HGWP sawmill was processing a larger timber volume than in the 2015-2017 years.

Nevertheless, the total amount of Haida Gwaii timber processed on the islands was small in 2002-2004 by comparison to the Haida Gwaii volume processed elsewhere, which is also the current situation. In the 2002-2004 period, an annual timber volume equivalent to about 5% of the Haida Gwaii public lands harvest (that was processed in BC) got processed locally.[123] In the 2015-2017 period, the portion of the HGMA lands harvest annually processed on the islands was lower yet, an estimated 0.6%.

The portion of the Haida Gwaii harvest processed in BC but controlled by Haida Gwaii focused operations did increase significantly, however, from the early 2000s period to the more recent period via Taan's acquisition of Haida Gwaii tenures and establishment of its custom cut program, which is in addition to the custom cut programs of O'Brien & Fuerst and Husby.

4.10.2.2 Employment Estimates for Processing of Haida Gwaii Logs in other BC Areas

The cedar logs from HGMA lands are being processed in BC, mainly in Lower Mainland sawmills via the custom cut programs of the Haida Gwaii forest sector operators, Taan, Husby and O'Brien & Fuerst

In the survey of Haida Gwaii tenure holders for this socio-economic report, they were asked for data on the BC processing facility destinations and export market destinations in 2017 for their logs.[124] An estimated 42.6% of the total log volumes of the Haida Gwaii survey respondents in 2017 was comprised of cedar logs directed to BC wood processors.

A distinct difference between the early 2000s and recent years is in the share of Haida Gwaii timber that was exported and so directed to wood processing facilities outside of BC; for example, in 2017, the estimated export volume from HGMA lands was 267,813 m^3, equivalent to 41.5% of the HGMA 2017 harvest.[125] The average annual export volume over the 2015-2017 period relative to the HGMA lands harvest was 36.9%. In the earlier 2002-2004 time period, only an annual average of 7.3% of the public lands harvest was exported. This shift in the destination of Haida Gwaii timber between the two time periods is due to the increased demand for BC softwoods timber in China and the associated Haida Gwaii log export exemption order that was initially put in place in 2010. This shift was also affected by

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[123] A small but unknown portion of the locally processed timber came from Haida Gwaii private lands so this figure is a slight overstatement of the portion of the Haida Gwaii Crown land harvest processed locally.

[124] Data was requested for only 2017 in order to simplify the effort for survey respondents. The 2017 year is considered representative of the recent processing and exporting situation on Haida Gwaii. The vast majority of the 2017 HGMA harvest is accounted for via the harvests of the survey respondents.

[125] Some of this 2017 export volume will have been harvested in 2016 and some of the 2017 HGMA harvest will be exported in 2018.

the low TFL 58 harvest during the 2015-2017 period as Teal Jones withdrew from Haida Gwaii.

The re-direction of a large portion of the Haida Gwaii hemlock and spruce harvests in recent years to export markets has resulted in reduced employment in other areas of BC that are based on processing Haida Gwaii timber. This shift to export markets reflects both strong demand conditions in Asian markets for hemlock and spruce logs and a weak competitiveness performance of the Coastal BC sawmill industry in making and selling hemlock and spruce wood products. Over the 2000-2016 period, the number of Coastal BC lumber mills has decreased by half, from 36 to 18 facilities and their fibre input has similarly decreased from 13.8M m^3 in 2000 to approximately 7M m^3 in 2016 (BC MFLNR 2018f). On Coastal BC, not a single new sawmill of significant size has been built since the Teal Jones Group built a small log mill in Surrey in 2003. In August 2018, the San Group Inc. announced a planned investment to upgrade a shuttered sawmill that this company purchased in Port Alberni.

Pulp logs directed to BC pulp and paper mills accounted for a small portion, 1.8%, of the total processed and exported HGMA log volumes in 2017 (based on the Haida Gwaii industry survey responses collected for this socio-economic report). This low pulp log share is due to both the high quality of Old Growth hemlock and spruce fibres on the islands and the relatively high cost of barge transporting logs from Haida Gwaii to southwestern BC. However, residual fibre created through the milling of Haida Gwaii logs into wood products at Lower Mainland mills is directed to BC pulp and paper making facilities and supported a substantial portion (approximately one-third) of the total processing direct employment connected to HGMA lands timber over the 2015-2017 period.[126]

In the 2015-2017 period, the majority of the wood processing employment in BC that was based on the input consumption of Haida Gwaii logs was located in the BC Lower Mainland as this is the location of the mills that Taan, Husby and O'Brien & Fuerst have been using for their custom cutting programs. The custom cutting programs of these Haida Gwaii harvesting operators accounted for the majority of the Haida Gwaii logs that stayed in BC for processing. These Haida Gwaii harvesting operators sold a small portion of their logs into the VLM and when Teal Jones operated on Haida Gwaii, this company, primarily, either directed its Haida Gwaii logs to its own Lower Mainland processing facilities or traded its Haida Gwaii logs to acquire other coastal BC logs for processing in its mills.

For the 2015-2017 years, the estimated average annual wood processing direct employment in BC outside of Haida Gwaii that was the result of processing timber harvested within the HGMA was an estimated 274 PYs. Most of the wood processing direct employment supported by Haida Gwaii logs was in facilities manufacturing cedar lumber products, such as

[126] Residual fibre volumes are a function of lumber manufacturing recovery rates, about 40% for Coastal BC lumber mills, and bark volume (about 12%) leaving almost half of log volume as useable residual fibre, comprising about 36% in chips and 23% in hog fuel and sawdust (Pierce Lefebvre Consulting and D.A. Ruffle & Associates 2002).

siding and decking components, an estimated 146 PYs. In addition, a portion of the cedar lumber products are further processed in BC remanufacturing plants.[127]

The direct employment based on milling Haida Gwaii hemlock and spruce logs in BC (outside of Haida Gwaii) was relatively small, an estimated 31 PYs. The residual fibres resulting from the milling of Haida Gwaii logs in the Lower Mainland are estimated to have supported an annual average of 94 PYs of employment at BC pulp and paper making facilities. Only 3 PYs of the estimated processing employment was based on chipping Haida Gwaii pulp logs and using the chips in BC pulp and paper mills. Table 4-18 shows the estimates of annual average employment supported by the processing of HGMA harvested logs in mills in other areas of BC.

Table 4-18: Estimated annual average employment supported by processing of HGMA harvested logs in other BC Areas, 2015-2017

	Employment (PYs)	Employment Co-efficient (PYs/'000 m^3) [128]	Total multipliers[129]
Cedar wood products manufacture			
Direct employment	146	0.418	-
Indirect and induced employment	124	-	1.85
Total employment	270	-	-
Spruce & hemlock wood products manufacture			
Direct employment	31	0.346	-
Indirect and induced employment	36	-	1.85
Total employment	67	-	-
Pulp & paper manufacture			
Direct employment	97	0.206	-
Indirect and induced employment	119	-	2.23
Total employment	216	-	-
All wood processing			
Direct employment	274	-	-
Indirect and induced employment	279	-	-
Total employment	553	-	-

[127] An estimate for BC remanufacturing plant employment is not included here as information is not available on the portion of cedar lumber products made in BC that are further processed in BC remanufacturing plants. A federal government study estimated coastal and Fraser Valley employment in remanufacturing plans as totaling an estimated 247 employees based on a 2012 survey of these facilities (Gregory, McBeath, and Filipescu 2018).

[128] The employment co-efficients are used to estimate direct employment, and are based on a study of coastal BC woodflow ((Pierce Lefebvre Consulting and D.A. Ruffle & Associates 2002). The co-efficients are multiplied by an estimate of the annual average timber volume by species processed in other areas of BC over the 2015-2017 period. The difference in the employment co-efficients between processing of cedar and hemlock-spruce timber is that a portion of the cedar harvest is processed in more labour intensive processing facilities, such as shake and shingle mills.

[129] Total multipliers are used to estimate indirect and induced employment. The shown BC total multipliers for "wood product manufacturing" and "pulp and paper manufacturing" are based on detailed industry data extracted from the BC Input-Output Model (BCIOM), which is maintained by BC Stats to analyze project and program spending in the province.

Source: survey of HGMA tenure holders, BC MFLNR 2018; Pierce and Lefebvre Consulting 2005; and author's calculations

The total estimate incorporates indirect and induced employment along with the direct mill-based employment. An annual average of 553 PYs of total employment are connected to the processing of Haida Gwaii logs in southwest BC mills. Although cedar wood products manufacture has the largest share of direct wood processing employment (approximately 53%), the indirect and induced employment in the pulp and paper sector is higher than in cedar products manufacture because of the higher level of spending of pulp and paper mills on goods and services and the higher income levels of pulp and paper mill employees.

The 2002-2004 employment estimate based on the Haida Gwaii harvest indicated a higher annual average level of wood processing direct employment (588 PYs) for outside of Haida Gwaii than is estimated herein (274 PYs) for the 2015-2017 years. The difference in wood processing direct employment between the two periods is due to three factors. One factor is that the average public lands harvest was about 20% higher during the 2002-2004 years. Another key factor is that the share of the Haida Gwaii public lands harvest shipped to export markets was much smaller over the 2002-2004 period so a much larger share of Haida Gwaii logs went to BC wood processing facilities during this earlier period than in recent years. The third factor is that this estimate for the 2015-2017 period incorporated a breakdown by species of the manufacture of Haida Gwaii logs.

4.10.3 Total Employment Estimates based on Harvesting and Processing HGMA Timber

During the 2015-2017 period, the estimated annual average direct employment in BC based on harvesting and processing HGMA timber was 622 PYs, and the majority of this direct employment, 333 PYs (53%), was in harvesting activities including log transport. However, although Haida Gwaii resident workers accounted for the largest share of harvesting direct employment (81%), on islands workers held less than half of the total (harvesting and processing) direct employment (43%) because of the very small amount of wood processing activity on Haida Gwaii (local workers accounted for only 5% of the direct employment supported by milling HGMA harvested timber). However as described in Section 4.10.2.2, Haida Gwaii focused forest sector operators control a significant portion of the processing and marketing of wood products based on HGMA timber that is manufactured in the province through their Lower Mainland-based custom cutting programs. Table 4-19 shows the estimated annual average employment supported by the harvesting and processing of HGMA timber of the 2015-2017 period.[130]

[130] The Haida Gwaii forest sector direct employment total estimate itemized in this table of 285 PYs (annual average for the 2015-2017 period) is in accordance with the estimate of a labour force in the Haida Gwaii forest sector of 290 workers (for 2016) that was itemized in Table 3-5 of Section 3.4. The latter estimate includes full-time and part-time workers. In addition, the Haida Gwaii forestry workers covered in Table 3-5 include workers who harvest timber on

Table 4-19: Estimated annual average employment supported by harvesting and processing HGMA timber, 2015-2017

	Direct Employment (PYs)	Indirect and Induced Employment (PYs)	Total Employment (PYs)
Haida Gwaii			
Harvesting	270	122	392
Wood Processing	15	7[131]	22
Total	285	129	414
Rest of BC			
Harvesting	63	208[132]	271
Wood Processing	274	285[133]	559
Total	337	493	830
BC			
Harvesting	333	330	663
Wood Processing	289	292	581
Total	622	622	1,244

Source: survey of HGMA tenure holders, BC MFLNR 2018; Pierce and Lefebvre Consulting 2005; and author's calculations

A similar level of annual average indirect and induced employment of 622 PYs is estimated to have been generated in the province as a result of harvesting and processing HGMA timber during the 2015-2017 period. The estimated direct and total employment effects of 622 PYs and 1,244 PYs, respectively, for the 2015-2017 period were lower than the direct and total employment estimates of 1,220 PYs and 2,393 PYs, respectively, which were calculated for the earlier 2002-2004 period (Pierce and Lefebvre Consulting 2006). The difference in employment levels between these two periods is primarily due to the following factors.

- Average Haida Gwaii Crown land harvest was about 20% higher during the 2002-2004 years compared to the 2015-2017 annual average level of 805,854 m^3.

Haida Gwaii private lands and process some of that private lands timber. The focus in Table 4-19 is only on harvesting and processing employment connected to HGMA lands timber.

The former estimate in Table 4-19 is based on person-years (PYs) of employment which aggregates the working time of full-time and part-time workers into a full-time position equivalent. The labour force or employment estimate based on number or workers, jobs or positions for a sector or industry should be slightly higher than an estimate of person-years of employment or full-time equivalent (FTE) positions.

131 Indirect and induced effects on Haida Gwaii only.

132 The indirect and induced employment in the rest of BC is positively affected by the large amount of direct harvesting activity that occurs on Haida Gwaii. The multiplier effect in the rest of BC connected to the on islands harvesting activity is higher than for Haida Gwaii because the service sectors in the Lower Mainland and in the main communities on Vancouver Island are more developed than the Haida Gwaii service sectors.

133 The indirect and induced effects in the rest of BC associated with wood processing are higher (285 PYs) in this table than in Table 4-19 (279 PYs) because the latter table only considers the indirect and induced effects associated with processing activity that occurs outside of Haida Gwaii. The small amount of processing activity on Haida Gwaii generates a small amount of indirect and induced effects in the rest of BC as well as having some indirect and induced economic effects on Haida Gwaii.

- The share of the HGMA lands harvest directed to export markets was much smaller over the 2002-2004 period so a much larger share of Haida Gwaii logs were processed in BC mills during this earlier period than in recent years.
- Improved labour productivity of harvesting operations on Haida Gwaii.
- The estimate for the 2015-2017 period incorporated a breakdown by species of the manufacture of Haida Gwaii logs so likely represents a slightly more accurate estimate of processing employment.

4.11 Haida Gwaii Timber Harvest Operating Costs

4.11.1 Introduction

Forest harvesting includes all phases involved in delivering a tree (log) to a processing facility. On Haida Gwaii, these phases typically include layout/planning, road construction, felling, skidding/yarding, processing, trucking, and barging, sorting, scaling, and log storage. In general, timber harvesting costs on Haida Gwaii can vary by terrain, equipment used, timber types, past development, and geographic location (which affects travel time, difficulty of access, and camp requirements).

Harvesting Coastal BC timber is relatively expensive by comparison to harvesting of softwoods timber in competing regions in the rest of North America, Europe and Asia. Table 4-20 summarizes a ranking of Coastal BC sawmills (as a group) against sawmills in other regions around the globe on four key factors, including delivered log costs. Albeit the comparative log cost situation for Coastal BC has improved over the 2002-2014 period used in this table, from 29th and worst in 2002, Coastal BC still sat well behind other regions on the dimension of delivered log costs in 2014, 11th, and sits behind all North American regions on this dimension.

Table 4-20: Coastal BC "Average" Sawmill Competitiveness Ranking in Global Survey, 2002, 2008 and 2014 (1 = best and 29 = worst)

Competitiveness factor	2002	2008	2014
Delivered log costs	29th	11th	15th
Sawmill costs	29th	12th	23rd
Lumber revenue	7th	15th	2Second
Earnings (EBITDA)	19th	19th	16th

Source: Taylor 2016

Timber harvesting on Haida Gwaii is often more expensive than in more southerly Coastal BC locations because of the difficult terrain in certain Haida Gwaii harvesting locations, the cost of barging logs from Haida Gwaii to Lower Mainland and Vancouver Island timber processing facilities, EBM requirements associated with on islands timber harvesting and use

of the FSC certification system (by Taan).[134] These relatively high logging and log (or lumber) transport costs result in higher input costs for Coastal BC wood processing facilities (including Haida Gwaii mills) as log input costs account for the biggest portion of their total costs.

Sawmilling costs on Coastal BC are also relatively high, in the global ranking outlined in Table 4-20, sawmill costs on Coastal BC were ranked 23rd (of 29 countries/regions). Again, as is the case with timber harvesting, wood processing costs on Haida Gwaii have been observed by various parties as more expensive than in southern coastal BC locations. A local mill has to contend with the cost of shipping its wood products to off island locations via truck transport and BC Ferries or a suitably equipped barge as the islands do not have a container port or direct links to railway services, electricity and fossil fuel costs are higher and opportunities for utilization of milling residues are limited.

Currently on Haida Gwaii, a significant portion of the landbase (approximately 40%) has been previously logged and is regenerating. A portion of these stands are currently old enough to harvest for the second time and have a different cost and fibre production profile than Old Growth stands. For example, Second Growth stands tend to be on gentler terrain, have shorter haul distances to market, have existing infrastructure in place that can be reused or upgraded (vs new construction), have high volume per ha with little rot, and stand types tend to be well suited for mechanized harvesting (more uniform with smaller diameters than old growth). These factors all tend to lead to lower harvesting costs for Second growth stands when compared to Old Growth stands.

The following sections describe each of the harvesting phases in more detail and provide estimated average costs experienced on Haida Gwaii. The cost estimates provided in this section are compiled from a review and synthesis of a few sources; the past experience of Forsite Consulting Ltd. in preparing Coastal BC timber harvesting cost analyses, a 2015 Haida Gwaii economic operability report (Ecora 2015), 2017 Coast Appraisal Manual (Timber Pricing Branch 2018), and personal communications with strategic planning foresters working on Haida Gwaii.[135]

4.11.2 Layout/Planning

Prior to the application for a cutting or road permit, a process of development planning occurs, which includes the planning of blocks and roads that are consistent with the following.

- commitments in Forest Stewardship Plans

[134] Taan is one of fourFSC certified forestry operations in BC; the others are Canfor (Prince George Division), Ecotrust Canada, and Harrop-Proctor Community Co-operative (Forest Products Association of Canada 2019).

[135] The shown cost estimates are estimates based on the author's synthesis of several sources of data and information and not as average costs or median costs based on a survey of harvesting operations.

- requirements of the FRPA and its regulations and of the Haida Gwaii Land Use Objectives Order
- engineering to locate planned roads and blocks in the field
- preparation of site plans/prescriptions
- timber cruising

The application for a cutting permit will then occur and an appraisal will take place to establish the stumpage rate applicable to the permit.

Specific to Haida Gwaii, planning and layout costs are higher than some other areas of Coastal BC due to the assessments required by the Haida Gwaii Land Use Objectives Order and the expense of flying in professionals to do this assessment work (such as for terrain, wildlife, and archaeology purposes) when Haida Gwaii professionals are not available to perform this work.

Typical layout and planning costs on Haida Gwaii are estimated as within a range of the following.

- Forest administration and planning: $8-10/m^3$
- Layout of Old Growth cut blocks: $7-9/m^3$ (less for ground-based harvesting systems and more for cable and helicopter harvesting systems)
- Layout of Second Growth cut blocks: $5-6/m^3$ (as above for Old Growth layout work, less for ground-based harvesting systems and more for cable and helicopter harvesting systems)

4.11.3 Road Construction, Maintenance and Deactivation

Road construction costs can vary widely according to whether an old road bed is present and, for new roads, by the terrain type and the number and type of stream crossings. Road building costs for accessing Second Growth timber can often be much lower because old road beds can be reactivated. New roads built through limited slope terrain that requires only hauled gravel ballast, culverts and digging for culverts only are at the lower end of the cost spectrum. At the high end, new roads on steep, rocky slopes or those with longer and/or more complicated stream crossings can cost over $200,000/km. The following table summarizes typical road construction costs on Haida Gwaii by the steepness of the terrain and the presence or absence of an old road bed.

Table 4-21: Typical Road Costs ($/km)

Cost Type	0-40% Slope	40-60% Slope	>60% Slope
New Construction ($/km)	$60-90,000	$120,000	$150,000
Reactivation ($/km)	$25,000 - $65,000 (includes culverts)		

4.11.4 Falling

Tree falling "by hand" on Coastal BC is often undertaken by independent contractors who provide their services throughout Coastal BC (rather than being done by an employee of a market logger or of a stump to dump contractor). Hand falling with chain saws is required on steeper slopes and/or in diverse stands having large diameter trees (typically Old Growth timber). On Haida Gwaii, the cost for hand falling lies generally in the $12-15/m^3$ range.

Mechanized falling using harvesters or feller bunchers is safer and more efficient than hand falling but can only be used in stands with smaller and more uniform diameter timber (typically Second Growth timber). The cost for mechanized falling on Haida Gwaii is typically in the $6-8/m^3$ range.

4.11.5 Skidding and Yarding

On Haida Gwaii, three primary methods are utilized for moving felled trees from the stump (harvest area) to the forest roadside landing area: hoe chucking, grapple yarding, and helicopter yarding.

Hoe Chucking

This system uses hydraulic log loaders high ground clearance to 'swing' or 'chuck' logs to the roadside. The hoe-chucker operator moves logs, either individually or in small bunches, one swing at a time before repositioning the machine. Hoe chucking is the least cost method of yarding logs to the roadside ($8-10/m^3$) but can only be used on gentle terrain (generally defined as less than 30% slopes).

Grapple Yarding

This system uses a large mobile tracked unit equipped with a tower, winches, wire rope (cables), and a large grapple designed to grab and pull (yard) logs from the stump to the roadside landing area. This system can be used on steep terrain as long as roads can be constructed that allow for the landing of logs and maintaining yarding distances (between the felled trees and roadside) below 300m. On Haida Gwaii, grapple yarding costs are typically in the $16-20/m^3$ range.

Helicopter Yarding

Helicopter yarding utilizes large helicopters to lift and air transport logs from the stump to either a roadside landing or a water drop site. The maximum weight of logs for an individual lift is less than what can be accommodated with cable logging systems but logs can be moved by helicopter up to 1.5 kilometres. The costs for helicopter vary by cycle time (distance), elevation change between the cut block and the landing site, landing site type (water or land), and log weight or payload per cycle. This system is used for high value timber growing on difficult to access by road and/or environmentally sensitive terrain. Cut blocks can be small and spatially dispersed without significantly impacting costs of helicopter yarding. Where existing roads or water drops can be used, helicopter costs are offset by reduced road building

and water dump site costs. Costs of helicopter yarding on Haida Gwaii range from $80-95/m^3.

4.11.6 Sorting, Primary Processing and Loading

The primary processing of felled trees plays an important role because this process ensures better conditions for superior wood valuing, economically and ecologically efficient wood harvesting, and full valuing of the marketable volume of marked trees. Once logs are moved to the roadside landing area, they are sorted, processed (bucked and delimbed) and loaded onto trucks. Bucking cuts the tree into merchantable logs, which is a significant activity affecting the potential value of the log. When felling is done by hand, bucking is usually done by the faller as well. As the tree is limbed, it is cut into log lengths of the greatest value.

Sorting ensures that trucks contain a log load destined for the same end point, while bucking to specific log lengths and delimbing is required to maximize log loads on trucks. The costs to complete these activities on Haida Gwaii is typically in the range of $7-10/m^3.

4.11.7 Transportation Costs

Loaded trucks transport logs from the roadside landing areas via forest roads and highways to where they are loaded onto barges for transport to the Port of Prince Rupert or Lower Mainland destinations, including Port of Vancouver terminals. Most Haida Gwaii Second Growth logs are transported by barge to the Port of Prince Rupert for export via bulk container ships to Asia and most Old Growth logs are transported by barge to booming areas or wood processing facilities located along Lower Mainland stretches of the Fraser River.

Booming and towing of logs as performed in Strait of Georgia waters is not a viable option for Haida Gwaii logs because of the difficult Hecate Strait waters between Haida Gwaii and Prince Rupert and the distance between Haida Gwaii and Vancouver.

Total trucking costs vary due to hauling distance but per m^3 trucking costs are estimated as about $0.15/m^3/km (so a 100 km haul would cost about $15/m^3). The majority of logging truck transport occurs on forest roads on Haida Gwaii because of the relatively modest distance of highways on the islands.

The cost of barge transport from Haida Gwaii to Vancouver, including operating water dumps and dryland sorts, is in the $18-20/m^3 range while the cost of barging from Haida Gwaii to Prince Rupert is in the $12-16/m^3 range.

4.11.8 Dump, Sort, Scale, Boom and Storage

At water dump sites, the cost of dropping ground anchors and installing boomsticks in a new area will be about $1/m^3.

The logging company or its agents sort logs prior to their scaling (for non-cruise-based sales) at scaling sites. Scaled logs are stored in booms or on land at Prince Rupert and in the Vancouver area.

The dump, sort, scale and boom costs amount to a cost of about $12/m^3$. The storage costs vary by the term and site of storage but typically amount to a cost of about $4/m^3$.

4.11.9 Miscellaneous costs including pile burning, insurance and contingency

In general, pile burning costs on Coastal BC are in the $0.25/m^3$ range. While insurance costs can vary widely in percentage terms, in absolute terms they account for a small amount of the total cost of harvesting. A range of insurance cost is $0.25 - $1.00/m^3$. In practice, the tenure holder would build a contingency amount into their proforma budget for estimating costs associated with logging of a cutting permit area. A figure of $1/m^3$ for contingency is used herein.

4.11.10 Total Harvesting Costs

Haida Gwaii is a high cost logging location competing in a global market

A wide range of logging costs is evident on Haida Gwaii but harvesting of Old Growth timber versus Second Growth timber and their associated terrain characteristics is the main point of cost differentiation in recent years and will remain so over the next couple of decades. Representative examples of total harvesting costs on Haida Gwaii for each of mechanized harvesting of Second Growth timber, hand falling and cable yarding of Old Growth timber and helicopter logging of Old Growth timber are shown in the tables below. In the shown examples, helicopter logging is the most expensive ($172/m^3$), followed by cable logging of Old Growth timber ($96/m^3$). Mechanized falling and yarding of Second Growth timber presents as the lowest cost harvesting system on Haida Gwaii ($79/m^3$).

Expenditures for stumpage, fee in lieu of manufacture (for exported logs), silviculture, management overhead and camp operations (if applicable) would be in addition to the costs shown in these tables.

Table 4-22: Mechanized Second Growth Harvest ($/m^3)

Total Costs	Plan & layout	New & reactivated road construction	Road maintenance & deactivation	Falling (mechanized)	Yarding (hoe chucking)	Loading & truck hauling	Dump, sort, scale & boom	Pile burn, insurance & contingency	Barge transport (to Greater Vancouver)	Store
$79	$7	$7	$1.50	$7	$9	$10	$12	$1.50	$20	$4

Table 4-23: Cable Logging Old Growth Harvest ($/m^3)

Total Costs	Plan & layout	New & reactivated road construction	Road maintenance & deactivation	Falling (hand)	Yarding (cable)	Loading & truck hauling	Dump, sort, scale & boom	Pile burn, insurance & contingency	Barge transport (to Greater Vancouver)	Store
$96	$7	$7	$1.50	$15	$18	$10	$12	$1.50	$20	$4

Table 4-24: Helicopter Logging Old Growth Harvest ($/m^3)

Total Costs	Plan & layout	Road construction	Road maintenance & deactivation	Falling (hand)	Yarding (helicopter)	Truck hauling	Dump, sort, & boom[136]	Pile burn, insurance & contingency	Barge transport (to Greater Vancouver)	Scale and store
$172	$20	$0	$1.50	$15	$90	$0	$12	$1.50	$20	$12

Source: Timber Pricing Branch 2018; Ecora 2015; personal communications with logging operators; and author's calculations

4.11.11 Forest Regeneration and Silviculture

Silviculture costs include site preparation, planting, and survey work required to monitor and declare the stands successfully regenerated.

HGMA TSA and TFL licensees are responsible for basic silviculture (i.e. establishment of a free-growing stand) on areas harvested under major licences. BC MFLNR is responsible for silviculture on areas harvested by BCTS award holders and on backlog not satisfactorily restocked (NSR) areas. If an area is harvested in the early summer, planning and site preparation work will often occur in the fall and planting in the following spring.

Regeneration practices on Haida Gwaii are tied to the tree species of the silviculture prescription for logged cut blocks. Natural regeneration (no planting) is used for hemlock and planting of nursery raised seedlings is used for Sitka spruce and western redcedar regeneration.

To be consistent with the Haida Gwaii Land Use Order, red or yellow cedar is planted into stands where they were previously present. Silviculture costs for planted cedar are significantly

[136] Cost of dropping booming ground anchors and installing boomsticks in a new area

higher than for other species because a protective cone must be placed over each cedar seedling to prevent deer from browsing (eating) the seedling. The estimated cost for adding and maintaining the cones is $5 per tree.

The 2017 BC Coast Appraisal manual uses a basic silviculture cost for Haida Gwaii of $5.11/m^3. Where cedar is regenerated, silviculture costs would be $6.11/m^3, i.e. about $1/m^3 higher. In the case of cut blocks logged with helicopters the silviculture cost would be $1/m^3 higher due to the distance of these logged areas from forest roads. Table 4-25 presents the cost for basic silviculture by coastal BC forest district as shown in the 2017 Coast Appraisal Manual.

Table 4-25: Basic silviculture cost in 2017 Coast Appraisal Manual for BC Coast forest districts ($/m^3)

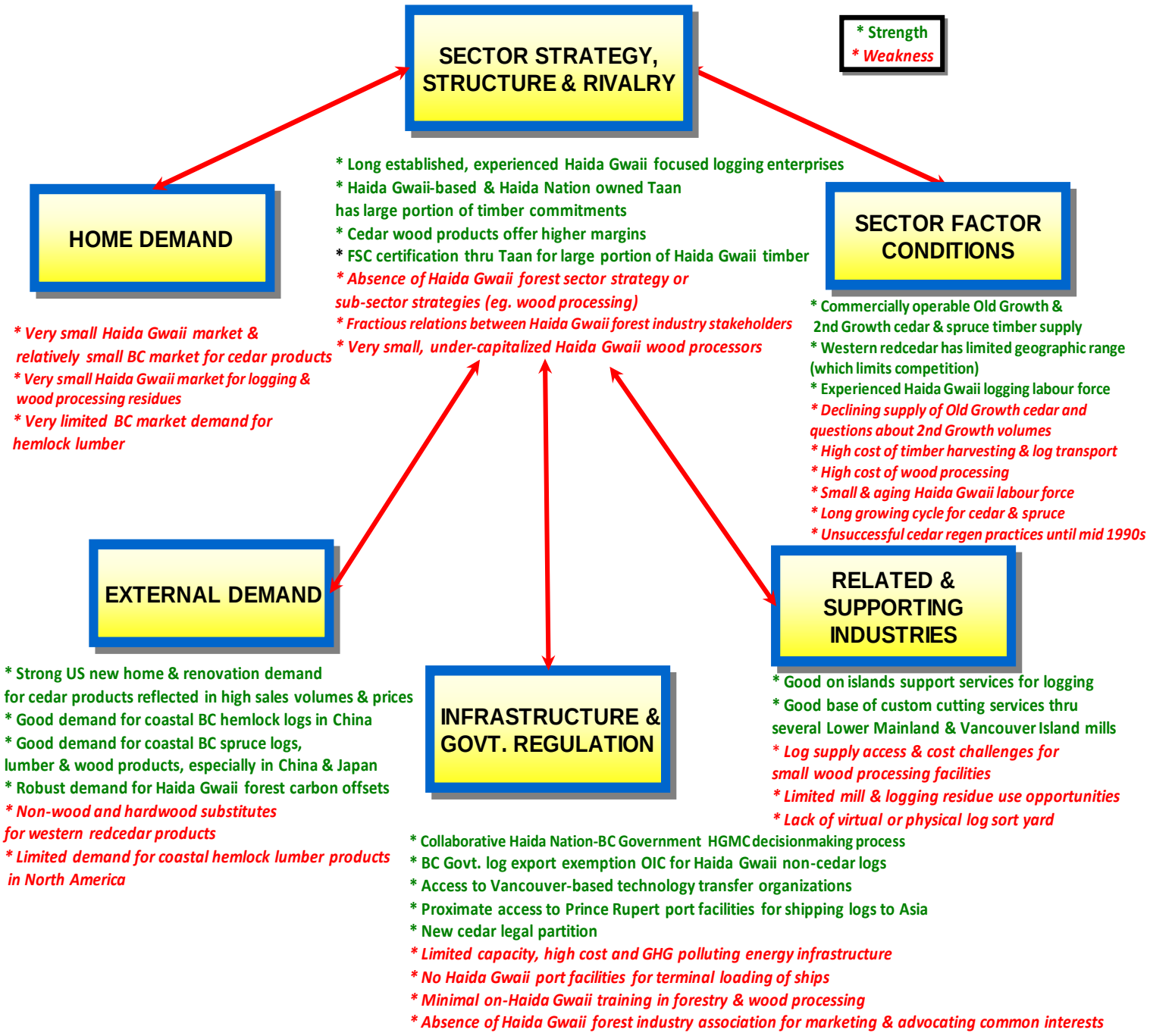
Forest District	$/*m^3
Haida Gwaii	5.11
Coast Mountain (North Coast)	10.64
Sea to Sky (Squamish)	6.05
Chilliwack	5.02
Sunshine Coast	3.95
South Island	3.43
Campbell River	3.18
North Island – Central Coast	3.01

Source: BC MFLNR 2018c

4.12 Situation Analysis Strengths and Weaknesses Summary

In Figure 4-15, the summary for the Haida Gwaii forest sector situation analysis is laid out on the basis of identified socio-economic strengths and weaknesses.

Figure 4-15: Summary of strengths and weaknesses of Haida Gwaii Forest Sector



5 Key Issues Going Forward

5.1 Introduction

The RFP for this socio-economic report included a Part II in which six questions were framed around issues that look forward at potential effects on the Haida Gwaii forest sector or potential effects of the local forest sector on Haida Gwaii communities and peoples. The six questions were as follows.

- [What is the] Role of cedar as an ongoing economic mainstay (i.e., sustainable supply of economic cedar)?
- What elements of community stability are dependent on timber supply?
- What contribution does wood provide to local versus regional/provincial markets?
- What are the variables and thresholds for second growth forests being economically viable?
- What are the barriers or enablers of fibre flow to local producers? Which barriers have the largest impact on the health of the islands economy?
- What is required (levels of harvest) to provide a security of investment for operators?

5.2 Role of Cedar

Harvesting cedar has been the "straw that stirs the drink" for the Haida Gwaii forest sector since the mid-1990s. The limited global supply of western redcedar and yellow cedar is manufactured into specialty or niche products sought by buyers who appreciate cedar's structural, visual and durability qualities. Cedar timber is distinct from other Coastal BC softwood species that are primarily used for internal (not visible) structural purposes. Cedar is used for outdoor landscape elements such as decks, planters, fences, screens, garden furniture and sheds and for exterior siding, roof tiles, interior wall and ceiling panelling, house timbers, doors and windows, and a variety of joinery items. The supply of western redcedar is essentially limited to northwest North America which caps the supply against a large base of demand for the specific and valued structural and visual qualities of this species.

The relative importance of cedar is not limited to Haida Gwaii; a recent federal government study of the BC cedar industry estimated that in 2015, 18% of Coastal BC lumber primary manufacturing employment was based on processing cedar logs, 501 workers. In addition, another estimated 415 workers were employed in remanufacturing plants and shake and

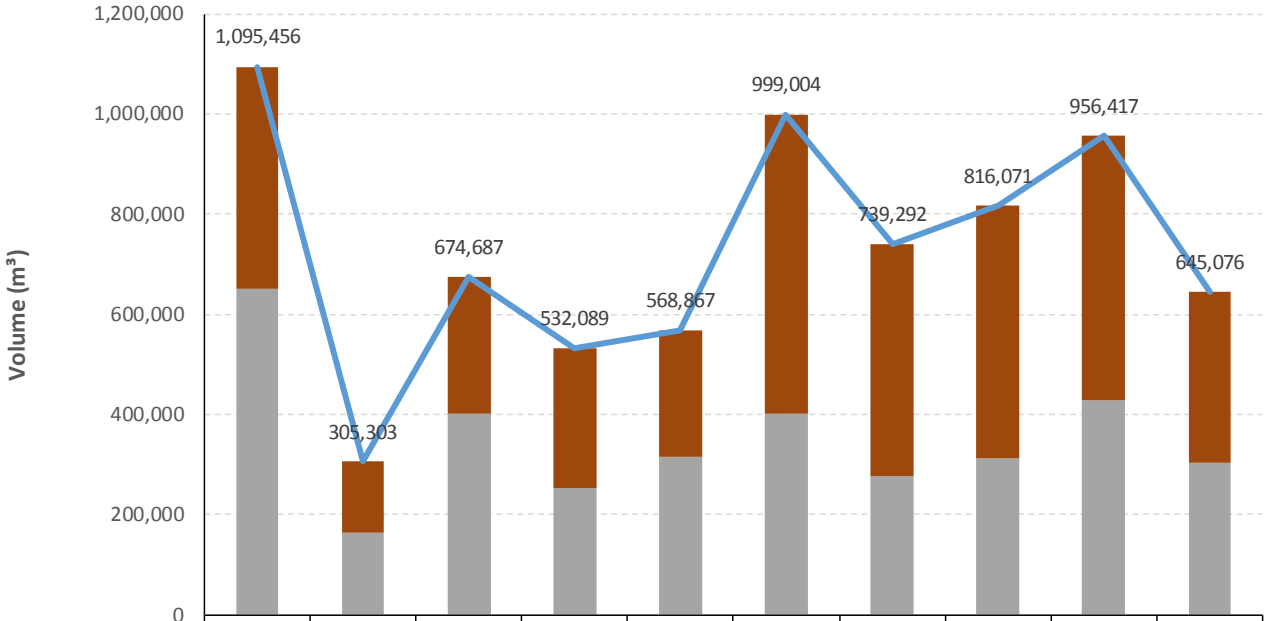
shingle mills in Coastal BC that were making cedar products (Gregory, McBeath, and Filipescu 2018).

A question in the RFP for this socio-economic project was [What is the] role of cedar as an ongoing economic mainstay (i.e. sustainable supply of economic cedar)?

The recent harvests of cedar on Haida Gwaii were laid out in Section 4.6. The annual average cedar harvest on HGMA lands over the 10-year 2008-2017 period was approximately 351,000 m^3, approximately 48% of the annual average total harvest. Cedar's share of the HGMA harvest ranged from approximately 38% to 60% over this decade. The annual average for the 5-year 2013-2017 period was slightly lower, about 344,000 m^3 (and a 41.4% share of the HGMA total harvest for this 5-year period).

A high level shift in the pattern of the HGMA harvest is seen starting in 2013 when the harvest for other tree species was greater than the cedar harvest. During this latest period, 1.4 m^3 of other species were harvested for every 1 m^3 of harvested cedar. In part, this recent high level harvest pattern reflects the attractiveness of prices in offshore markets for whitewoods logs and the presence of the Haida Gwaii log export OIC. In the earlier 5-year 2008-2012 period, the harvest pattern was reversed with only 0.8 m^3 of other species being harvested for every 1 m^3 of harvested cedar. This earlier harvest pattern was heavily influenced by the 2008 global financial crisis and its aftermath; the niche cedar products demand recovered quicker than the demand for whitewood products. Figure 5-1 summarizes the harvest of cedar versus the harvest of other species on Haida Gwaii over the 2008-2017 decade.

Figure 5-1: HGMA cedar harvest versus harvest of other species (m^3), 2008-2017



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Other Species	443,725	140,574	274,215	279,066	252,571	597,878	461,419	504,735	529,047	342,941
Cedar	651,731	164,729	400,472	253,023	316,296	401,125	277,873	311,336	427,370	302,135
Total	1,095,456	305,303	674,687	532,089	568,867	999,004	739,292	816,071	956,417	645,076

Source: Harvest Billing System 2018 and author's calculations

In a weak or limited whitewoods export log situation, cedar carries the commercial operability of logging on Haida Gwaii. A substantive decrease in the prices for cedar logs and/or the available supply for commercial harvesting would deeply challenge the financial viability of timber harvesting on Haida Gwaii due to the relatively high cost of timber harvesting on and transport of logs from Haida Gwaii (see Section 4.10). An unusually large downward shift in cedar prices is not likely because of the strong market presence and demand for cedar products in the US and the already limited (global) supply of western redcedar and yellow cedar timber. If cedar timber supply were to be reduced, for instance for the purpose of managing the supply of cedar timber over time, then the operability on Haida Gwaii of hemlock and spruce would be strongly dependent on continuing access to and price strength in export markets as domestic prices for hemlock and spruce logs have not been (and are not foreseen to be) at levels that can support Haida Gwaii harvesting and transport costs.

While cedar timber supply indeed is a mainstay of the Haida Gwaii forest sector, of substantive importance too is access to export markets for whitewoods. If the current dynamics that make up the foundation of the Haida Gwaii forest sector are substantively altered then many forest stands that are currently operable are likely to become uneconomic to harvest resulting in lower forest sector employment on Haida Gwaii, and associated reductions in spending at local suppliers of goods and services and, very likely, a population

decrease due to an out-migration of some workers seeking employment elsewhere and bringing along their families (See Section 5.3).

In practice, timber rights holders will use the dictates of market demand as much as possible to determine what, where and when they log. Timber rights holders will select harvesting situations with species and costs that are sustainable under expected market conditions. However, the following table was constructed to offer a high-level account of the importance of western redcedar to the financial viability of timber harvesting on Haida Gwaii. Table 5-1 uses average logging and stumpage cost along with average VLM log prices by species to indicate the importance of the relative level of red cedar within Haida Gwaii harvesting. The figures in the table should be interpreted as indicative and represent neither the financial results for harvesting a specific stand (with a specific species mix, tenure, terrain conditions, etc.) nor the financial results for the overall 2017 HGMA harvest.[137]

Table 5-1: Net revenue example based on average cost and log value for Haida Gwaii, 2017

Species	Average logging & transport cost[138]	Average stumpage	Logging + Stumpage	Average VLM log value	Average net value per m^3	Species Distribu-tion[139]	Average net value by species distribu-tion
Red Cedar	$96.00	$21.56	$117.56	$191.57	+ $74.01	46.8%	+ $34.64
Spruce	$96.00	$6.33	$102.33	$63.78	- $38.55	20.8%	- $8.01
Hemlock	$96.00	$17.89	$113.89	$58.48	- $55.49	26.6%	- $14.76

Sources: Harvest Billing System 2018; Source: Timber Pricing Branch 2018; Ecora 2015; personal communications with logging operators; and author's calculations

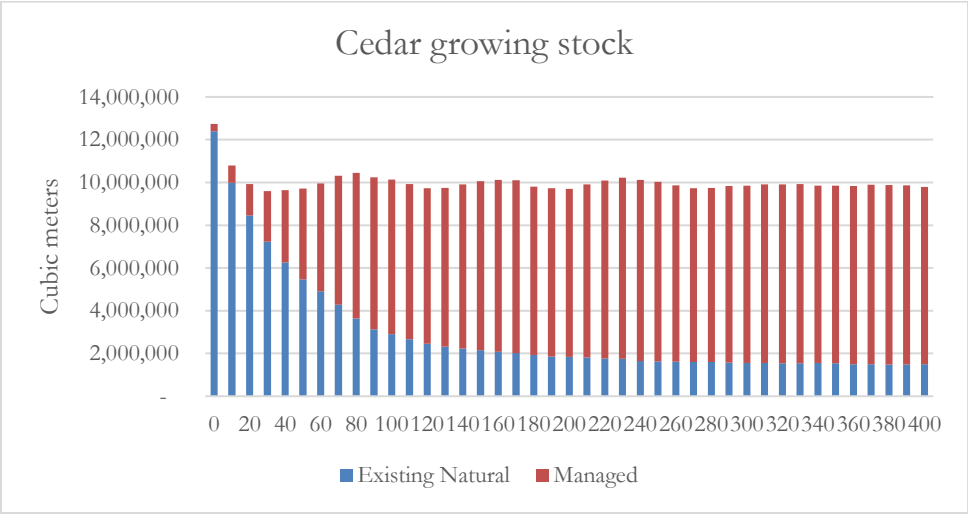
The HGMC's 2012 AAC determination referenced an anticipated mid-term shortage or fall down of cedar on Haida Gwaii as does the analysis work undertaken for the latest Haida Gwaii timber supply review (HGMC 2012; Technical Working Group 2019). Figure 5-2 shows the projected decline over the next 40 years in the overall stock of cedar and the steep decline in stock of Old Growth cedar over at least the next 100 years in the HGMA for the analysis base case of the current timber supply review.

[137] As specific stands will vary by terrain, species composition, timber age, log grade distribution and distribution of log sales between export and domestic markets.

[138] Assume cost for cable logging of Old Growth timber

[139] Based on average harvest volume

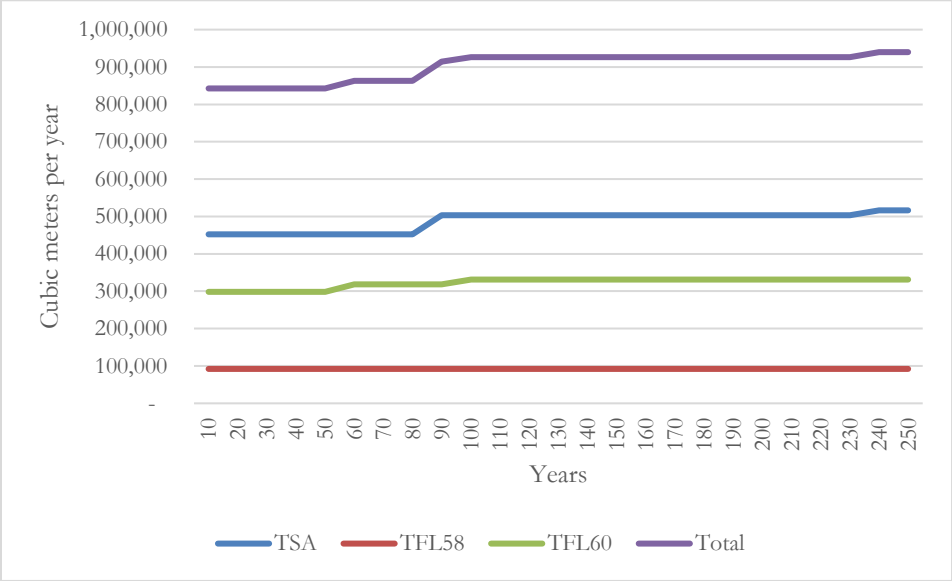
Figure 5-2: HGMA Lands Base Case Cedar Growing Stock, Natural Stands and Managed Stands (m3)



Source: Technical Working Group 2019

The Technical Working Group for the current timber supply review has put forward an analysis base case timber supply projection that incorporates applicable forest management rules for the HGMA, including the Haida Gwaii LUOO, and a non-declining timber supply flow over a 400-year projection period. The HGMC will use the analysis base case as a starting point for its review of information leading to an AAC determination and will consider other information and timber supply projections as well. Therefore, the base case neither presumes nor presents a decision on the AAC. The analysis base case annual timber supply for the HGMA is 842,781 m^3 until the 10^{th} decade whereupon the annual timber supply is projected to increase to 926,600 m^3 and remain at that level in subsequent decades. Figure 5-3 shows the HGMA base case timber supply projection by management unit.

Figure 5-3: HGMA Base Case Timber Supply Projection by Management Unit, m³



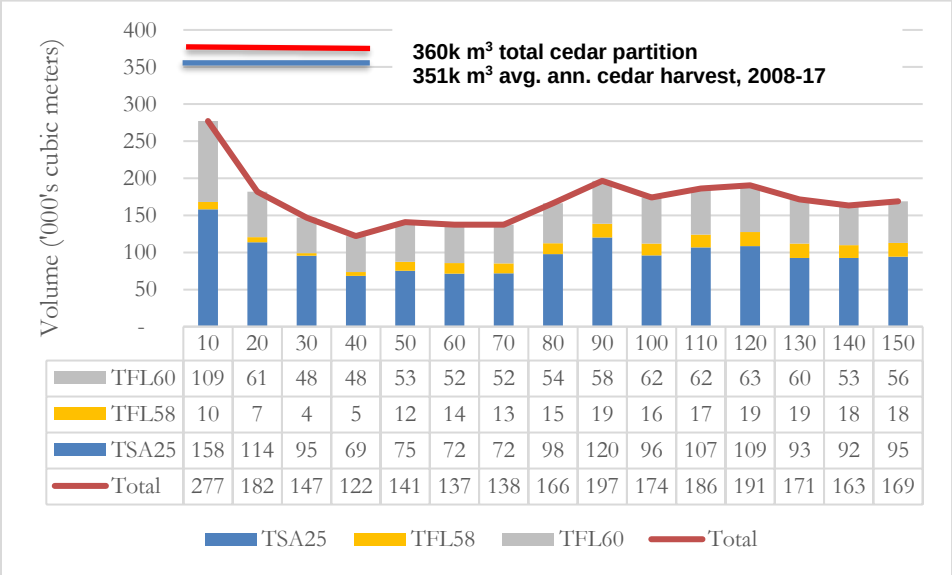
Source: Technical Working Group 2019

This HGMA base case projection incorporated a declining flow timber supply projection for cedar, the target starting point of which was the maximum cedar harvest level from the previous chief forester AAC determinations. The annual timber supply volume of cedar in the base case starts (in the 1st decade) at 277,000 m³, steeply declines to 122,000 m³ by the 4th decade and then increases to approximately 176,000 m³ by the 8th decade .[140]

The base case annual cedar volume projection starts slightly lower than the average annual cedar harvest (for the 2008-2017 period) of approximately 351,000 m³ and lower than the sum of the maximum cedar harvest levels expressed by the chief forester of 360,000 m³. By the 6th decade, the cedar share by volume of the HGMA base case timber supply is substantively different (about 10% cedar/90% other species) than the cedar partition share of the current AAC determination (about 39% cedar/61% other species). As well, by the 8th decade, the cedar growing stock is almost evenly split between unmanaged and managed stands, and thereafter the managed cedar stock volume increasingly outstrips the cedar unmanaged stand volume. Figure 5-4 shows the cedar volume projection for the HGMA base case by management unit.

[140] If a long run average yield (LRAY) approach was taken to projecting cedar timber supply in the HGMA base case then the cedar volume projection would be an average 146,371 m³ (Technical Working Group 2019). (Technical Working Group 2019).

Figure 5-4: Cedar Volume in HGMA Base Case Timber Supply ('000 m³) by Year



	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
TFL60	109	61	48	48	53	52	52	54	58	62	62	63	60	53	56
TFL58	10	7	4	5	12	14	13	15	19	16	17	19	19	18	18
TSA25	158	114	95	69	75	72	72	98	120	96	107	109	93	92	95
Total	277	182	147	122	141	137	138	166	197	174	186	191	171	163	169

Source: Technical Working Group 2019

Within 30 years, the base case cedar volume projection shows an annual cedar harvest level of about 146,848 m³, which would be almost the same harvest amount as that experienced in only one year, 2009, in the past 10. This annual level would likely be in place for about 10 years, and then drop further yet.

The shown projected shifts in annual cedar timber supply volume would be subject to regular review and potentially revisions through the timber supply review process (which must occur at least every 10 years). These projections (notably the projected steep declines in cedar volumes and increasing share of hemlock in the HGMA timber supply in the next few decades) and the anticipated increase in market values per m³ due to the shrinking supply of Old Growth Coastal BC timber indicate that policy and administrative approaches for the management of cedar timber supply over time will be an important consideration for the HGMC and the Chief Forester in HGMA related AAC determinations now and well into the future.

At a high level, the current and near-term timber stock and supply situation of TFL 58 provides a glimpse into the timber stock and supply situation in 30 years of the other Haida Gwaii management units. Relative to TSA 25 and TFL 60, TFL 58 currently has a lower share of cedar and a higher share of managed stands in its timber stock and supply. Therefore, the TFL 58 situation will offer, in the short-term, a window on key socio-economic aspects of the TSA 25 and TFL 60 timber supply situations in a few decades. However, the ownership and marketing of logs from TFL 58 changed in 2017 so it is too early to make observations about

the socio-economic ramifications of a low cedar/high managed stands timber supply in the Haida Gwaii context based on the TFL 58 experience. The TFL 58 situation may not be generally applicable because of its substantial spruce component,smaller timber supply and (current) absence of a custom cut program, but, at a minimum, the TFL 58 situation will provide an early indication in a few years of how an experienced Coastal BC tenure holder opts to deal with the implications of handling a low cedar/high managed stand timber supply on Haida Gwaii.

5.3 Community Stability and Timber Supply

Harvesting of cedar trees on Haida Gwaii has been occurring for as long as the Haida have populated the archipelago. Haida have used cedar timber for making longhouses, totem poles, large canoes, household goods, and articles of clothing. The arrival of colonizers in the late 1800's and early 1900's introduced steam driven machinery along with crosscut saws to the islands. Subsequently, the technology introduced to the islands became much more productive and cost efficient from an industrial perspective and by the late 1970s and 1980s large volumes of timber were being harvested on Haida Gwaii and barge transported to southwest BC booming grounds and mills (Gowgaia Institute 2007).

During the latter part of the 20th century, forestry grew into one of the key local economic sectors, and along with commercial fishing, mining and the defence installation at Masset, contributed to population growth in the Haida Gwaii communities of Port Clements, Masset, Queen Charlotte and Sandspit. The population of the islands peaked in the early and mid-1990s.

The following table presents the distribution (i.e. percentage share) of income by major source for Haida Gwaii over the 1991-2006 period and shows the significant importance of forest sector employment income on the islands in the 1990s and 2000s and then the relative decline of this source in the 2006 figures.

Table 5-2: Percentage share distribution of income by employment and non-employment income source for Haida Gwaii, 1991, 2001 and 2006

Year	Forestry	Mining	Fishing	Agri-food	Tourism	Public Services	Other Basic sectors	Transfer Payments	Other non-employment income
2006	14	0	7	1	11	31	7	18	12
2001	33	0	4	1	7	30	8	11	6
1996	34	0	0	0	8	32	4	9	6
1991	26	1	3	0	6	36	8	12	8

Source: Horne 2009a

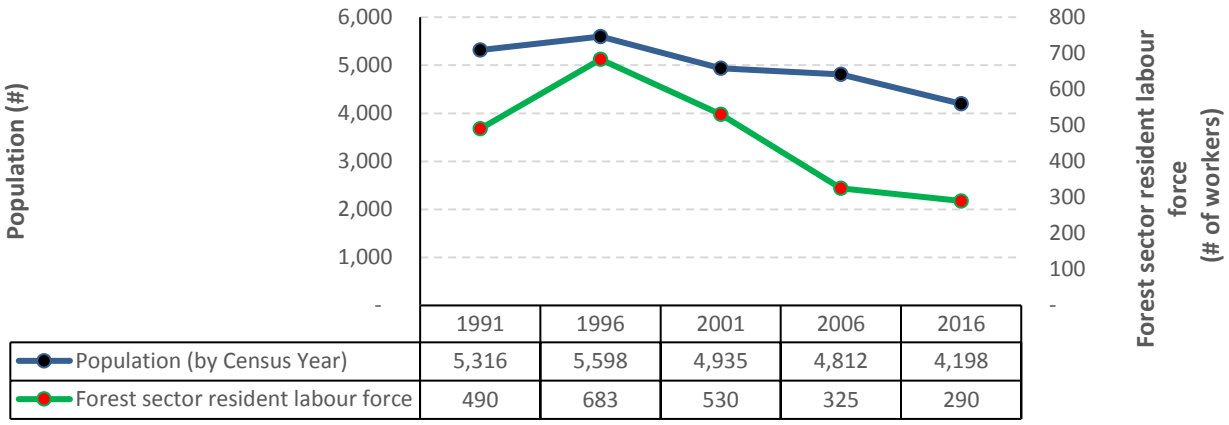
A question in the RFP for this socio-economic project was "What elements of community stability are dependent on timber supply?"

The forest sector employees residing on the islands create both a demand for public services in health, municipal infrastructure, schools and recreation but also contribute to a residential tax base and a critical mass or base of residents that could support the public services of small organized communities. These forest worker households also contribute to creating a customer and client base sufficient to support a small but reasonably broad range of retail and professional services and food and beverage businesses spread across the Haida Gwaii communities. Although the industrial tax base connected to the Haida Gwaii forest sector has always been relatively small because a medium- or large-scale sawmill has never been established on the islands, public sector services have been supported by the commercial property taxes paid by the local forestry related enterprises. As well, the demand for goods and services by the main forestry enterprises has helped to support the commercial viability of some key businesses serving the islands, such as the fuel barge transport service.

A few elements of community stability on Haida Gwaii are directly tied to timber supply decisions and timber harvesting levels. As portrayed in the previous paragraph, forest industry employment has been a key driver in the development of Haida Gwaii communities through their contributions to the local tax base but also through the households of forest industry workers making up a significant part of the population of a few Haida Gwaii communities. Their presence in these communities helped create a demand for basic public sector, retail, financial and basic professional services that assisted in their development and helped to sustain their operation over the past few decades. The commercial property taxes of forest industry related enterprises have also helped support local public services. The shrinkage in the Haida Gwaii forest sector has particularly affected Port Clements because of the sector's greater importance in the economy of this small community. As families leave the community, fewer children are enrolled in the local elementary school for example and the smaller school population adds to the challenge of attracting professionals and families to the community (pers. comm. G. O'Brien 2018).

Forest sector related employment is the main pathway through which the forest sector has direct effects on Haida Gwaii population levels and ultimate effects on the islands' community stability. Table 5-2 shows the direct correlation between Haida Gwaii's population levels and the number of local workers employed in the Haida Gwaii forest sector. Both Haida Gwaii's population and the Haida Gwaii forest sector have declined for the shown years since 1996. The decrease in population has not been as sharp in percentage terms as for the forest sector labour force because a portion of the terminated forest sector workers either retired or switched to work in another sector on Haida Gwaii rather than move elsewhere and because local tourism sector related employment rose (but not enough to offset the effects of the decline in forest sector related employment).

Figure 5-5: Trend Comparison of Haida Population and Forest Sector Resident Labour Force by Census Year



	1991	1996	2001	2006	2016
Population (by Census Year)	5,316	5,598	4,935	4,812	4,198
Forest sector resident labour force	490	683	530	325	290

Source: Census of Canada

5.4 Contributions of Haida Gwaii Wood to Haida Gwaii, BC and International Markets

From a wood products market perspective, the Haida Gwaii situation is consistent and in accord, in a broad sense, with other areas of BC in that the vast majority of Haida Gwaii timber fibre is ultimately sold into international markets. The local Haida Gwaii demand for wood products, especially cedar products, is vibrant in that wood is the focus of local structural and exterior building materials, but the local marketplace is nevertheless very small. In the case of Haida Gwaii, the vast majority of its timber is sold either as cedar lumber products into the US or as whitewood logs into China and a few other Asian countries.

Several economic dimensions of Haida Gwaii timber and wood products were examined in this socio-economic report.

- Haida Gwaii and BC demand for wood products in Section 4.2
- External market demand, including VLM and export log prices in Section 4.3
- Export log volumes in Section 4.6.9
- Haida Gwaii wood processing sector overview in Section 4.9.7
- Market destinations of Haida Gwaii timber in Section 4.10.2.2
- Haida Gwaii and other BC harvesting and processing employment in Section 4.10

A question in the RFP for this socio-economic project was "What contribution does wood provide to local versus regional/provincial markets?"

A distinct characteristic of the Haida Gwaii situation is that very little Haida Gwaii timber is milled on Haida Gwaii into wood products but a large portion of the processing of Haida Gwaii timber is controlled by Haida Gwaii focused enterprises. However, the processing situation in regard to Haida Gwaii timber has evolved over the past decade in that a larger portion of the processing of Haida Gwaii timber is now controlled by Haida Gwaii focused enterprises. A brief overview of the not widely known practice of custom cutting in BC was given in Section 4.9. Both Husby and O'Brien & Fuerst have had long established custom cutting programs whereby they have maintained control of the processing and marketing of their Haida Gwaii timber through rental of capacity at Lower Mainland mills and log trades. Taan now controls the largest share of the HGMA AAC and it created a custom cutting program using Lower Mainland sawmills as well. The volume and share of the Haida Gwaii timber harvest that is directed through the custom cut programs of Husby, O'Brien & Fuerst and Taan varies on a year to year basis due to several supply and demand factors, including the proportion of cedar in the total harvest, but in broad terms, the share is about 40% in recent years.

From the supply side, the main factor influencing Haida Gwaii log exports has been the 2010 BC Government order-in-council (OIC) that effectively allows for exporting of Haida Gwaii whitewood logs harvested on BC Crown lands and BC private lands in any current year equivalent to 35% of the prior year's total harvest volume (excluding waste volumes) from these BC lands.

Since the 2010 introduction of the Haida Gwaii exemption order, whitewood log exports from Haida Gwaii to Asian destinations have greatly increased, driven by the considerable gap in whitewood log prices between offshore and Coastal BC markets, and here the Haida Gwaii logs are processed into, mainly, structural lumber products. All current parties holding major Haida Gwaii tenures are whitewood log exporters.

Red and yellow cedar logs harvested on pre-1906 Crown grant (or federal export jurisdiction) private lands and Indian Reserve lands are not subject to measures preventing their export so these lands comprise the main sources of export volumes of Haida Gwaii red and yellow cedar logs. The main factor here was the sale in 2004 of the private lands portion of TFL 39 Block 6, approximately 10,000 ha by WFP to BC Investment Management Co. These lands are pre-1906 Crown grant (or federal) private lands and as such, with the removal of these private lands from the TFL, the new owners were able to export red and yellow cedar logs harvested on these lands. The export volume from these private lands owned by BC Investment Management Co. averaged 44,500 m^3 over the 2010-2016 period.

In January 2019, the BC Government extended the Haida Gwaii log export OIC but only until July 31, 2019 and communicated that a plan or strategy to address BC log export policy and TSL bidding issues is forthcoming. An elimination of this Haida Gwaii OIC would not change log demand conditions in Chinese, South Korean and Japanese markets but would negatively alter the commercial viability of harvesting stands on Haida Gwaii with low cedar

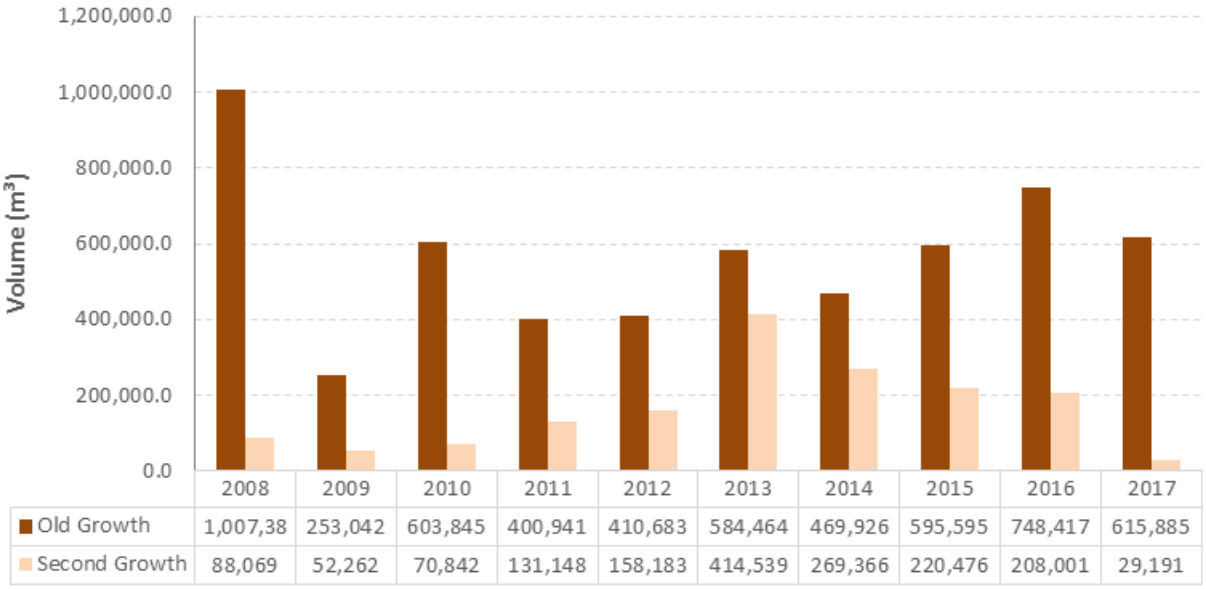
and/or spruce components. Removal of the Haida Gwaii OIC is likely to lessen the demand for Haida Gwaii hemlock timber and contribute to softening VLM prices for whitewoods, thereby leading to a reduction in the Haida Gwaii timber harvest and associated employment. Because little volume of whitewoods is processed on the islands and any future expansion in local processing is likely to focus on cedar products, the main beneficiaries of an elimination of the Haida Gwaii OIC are owners (and employees) of mills in south Coastal BC.The matter of log exports and Coastal BC log processing is exceedingly complex and its dimensions and characteristics vary along the BC Coast. Definitive conclusions aren't yet possible about potential effects to the Haida Gwaii forest sector since the contents of the BC Government's log export policy changes are not known at this juncture but the Haida Gwaii case should be looked upon as highly sensitive to alterations in the current OIC given the relatively high cost structure of harvesting and transport of Haida Gwaii timber.

5.5 Second Growth Forests Economic Viability

A significant portion of the Haida Gwaii THLB (approximately 40% has been previously logged and is regenerating. A portion of these stands are currently old enough to harvest for the second time. Over the 2008-2017 period, a total volume of approximately 1.6M m^3 of Second Growth timber or an annual average of 164,208 m^3, has been harvested within the HGMA.[141] Figure 5-6 compares the harvest volume of HGMA Second Growth timber to the Harvest of Old Growth timber over the 2008-2017 decade. Second Growth timber accounted for 22.4% of the total HGMA harvest volume during this decade.

[141] The Second Growth harvest drops from approximately 200,000 m^3 in 2016 to 29,000 m^3 in 2017. A factor in this decrease was the transition in ownership of TFL 58 from Teal Jones to A&A.

Figure 5-6: Comparison of HGMA Old Growth and Second Growth Timber Harvests (m^3), 2008-2017



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Old Growth	1,007,38	253,042	603,845	400,941	410,683	584,464	469,926	595,595	748,417	615,885
Second Growth	88,069	52,262	70,842	131,148	158,183	414,539	269,366	220,476	208,001	29,191

Source: Harvest Billing System 2018 and author's calculations

Second Growth timber on Haida Gwaii presents different challenges for the local forest sector on both cost and revenue sides of the financial ledger. A question in the RFP for the socio-economic project focused on Second Growth forests, "What are the variables and thresholds for second growth forests being economically viable?"

Considerable experience has already developed on Haida Gwaii with both harvesting and marketing Second Growth forests. Within an overall Coastal BC context, the BC Government and forest industry organizations, such as FPInnovations, have led research and policy-making on challenges, opportunities and strategies to understand and address the shift from harvesting and processing Old Growth timber to Second Growth timber throughout the BC Coast.[142]

On the cost side, in general, harvesting Second Growth stands presents cost advantages. In Section 4.11.11, the costs on Haida Gwaii of operating harvest systems for both Second Growth and Old Growth stands were documented. Based on the shown examples, the harvest and transport cost for the Second Growth focused system was approximately \$79/m^3 and 82% of the approximate \$96/m^3 cost of the Old Growth focused harvesting system. Specific stands will vary in their costs based on stand volume, terrain, location proximity to a

[142] The "BC Coastal Forest Sector Hem-Fir Initiative" is possibly the most well-known effort, see http://www.bccoastalinitiative.ca/index.html. This program included a "Coastal Cedar Focus".

forest road, etc. but this comparison conveys the relative cost advantage presented by harvesting Haida Gwaii Second Growth stands.

The lower per m^3 harvesting cost would largely be captured at the expense of employment as more mechanized harvesting and less road and bridge development would reduce labour requirements. A transition to more mechanized harvesting also reinforces a movement towards larger timber volumes for harvesting operations in order to spread out the new overhead capital costs, associated with acquiring mechanized harvesting equipment, over a larger scale of production.

On the other side of the ledger, Second Growth cedar logs realize a lower price in the Vancouver Log Market than Old Growth cedar logs. The VLM log price data presented in Section 4.3.1 shows the value gap in average terms between Second Growth and Old Growth cedar logs. Over the 2015-2017 period, the price of Second Growth cedar logs was between $178 and $205, and an average of $191 whereas the range for Old Growth logs was $187 to $233, and an average of $213. Using these recent average log prices for comparison purposes, Second Growth logs captured a price in the VLM that was about 82% of the recent average prices for Old Growth cedar logs.

We focus here on log costs and prices but milling lumber recovery rates and costs and wood products, including types that can be manufactured, their quality and wholesale and retail price vary by whether Second Growth or Old Growth logs are used as the fibre input. Understandings about many of these Second Growth cedar lumber product issues are still in development. FPInnovations undertook a couple of short research exercises in these areas, one on milling and another on competitiveness and one of the conclusions was that additional research is needed, "A comprehensive research task force approach is recommended to provide definitive answers to questions and contradictions obscuring a clear understanding of the properties and potential of second-growth redcedar. The task force should be similar to those undertaken on the coast for Douglas-fir and western hemlock." (Middelton and Munro 2013).

5.6 Timber Flow to Local Producers

A longstanding local concern on Haida Gwaii, but also a general concern in several parts of the province, has been the challenges in acquiring timber that small- and medium-sized mills face in acquiring timber to process into wood products. A question that was raised in the RFP for this socio-economic study was as follows, "What are the barriers or enablers of fibre flow to local producers? Which barriers have the largest impact on the health of the islands economy?"

The barriers of fibre flow to local wood processors that were identified in the interviews conducted for this socio-economic project were the following.

- Market-based log pricing for logs used by licensees. Some respondents thought that VLM pricing less a barging and distribution cost adjustment made logs too expensive for local small-scale processors given the higher price structure in the VLM in recent years and expressed a preference for log pricing to local processors based on harvesting cost plus local delivery cost.
- Payment conditions for acquiring logs from licensees. A few respondents thought that local processors were not in a cash flow position to pay for acquired logs until they received payment for selling wood products.
- Absence of secure, long-term fibre access arrangements for small-scale processors.
- Lack of BCTS Category 2 program auctions on Haida Gwaii for for local enterprises with micro- or small-scale wood processing operations.
- Financial challenges of Haida Gwaii small-scale wood processors to compete with more financially competitive bidders in BCTS TSL and Category 2 program auctions.
- No Haida Gwaii log sort operation to direct fibre to local processors along the lines of the monumental cedar log sort operated by the Ministry.
- No organized notification of available local fibre via a website or other means.

Certain licensees, Taan and A&A, make efforts to communicate their willingness to sell logs to local enterprises and to respond to requests for fibre from local processors. An awareness of the efforts of these licensees to make fibre available to local processors appears to be generally present within the local forest sector.

The issue of access to and cost of fibre for small- and medium-scale wood processors on Haida Gwaii is longstanding. In the late 1990s, Forest Renewal BC (FRBC) funded a few reports on growing wood processing activity on Haida Gwaii (Queen Charlotte Adventures 1998a; Queen Charlotte Adventures 1998b; and Dunn and Quass 1999). One of these reports was a "Directory of Logs for Sale on QCI / Haida Gwaii" (Dunn and Quass 1999). The directory was promoted as a kind of "virtual log yard". All the licencees on the islands set out volume and species availability along with pricing conditions in this directory. One of the then licensees, MacMillan Bloedel Ltd., offered 5-year renewable agreements for annual 25-30,000 m^3 volumes to local sawmills.

The matter of access and cost of fibre for Haida Gwaii wood processors was also raised in the 2015 Forestry Strategy Forum and its background discussion paper, which also pointed out a few other matters that also have substantial effects for the competitiveness of small scale wood processing on Haida Gwaii, "The lack of a stable, vibrant manufacturing sector is usually attributed to the lack of long-term availability of a supply of high quality logs, the inability to secure capital and lines of credit, the small local market, the lack of a stable trained work force, energy and waste issues, and the lack of information about, and access to, off-island markets." (Moore Resource Management 2015a).

"[Local] access to secure and suitable long-term wood supplies" was identified in the Summary of the 2015 Forestry Strategy Forum as one of four issues that needed addressing in the short-term (Moore Resource Management 2015b).

Prior to 2003, for several years the BC Government operated the Small Business Forest Enterprise Program (SBFEP). This program incorporated a 10M m^3 per year initiative established in 1978 to provide access to timber to entities with less than 10,000 m^3 per year of renewable tenure and the Section 21 initiative was later added that provided competitive access to market loggers and wood processors without tenure to approximately 3M m^3 of timber per year. The Abfam/Haida Gwaii Wood Products mill in Port Clements was established through accessing a SBFEP tenure. This program however was shuttered in 2003 when BCTS was established and its Category 2 program was created but the Category 2 program allows access to bidding by wood processors with tenure.

A province-wide industry organization, Independent Wood Processors Association, has represented the interests of its medium-scale wood processor members that do not have long-term tenures. Between 2001 and 2018, 54 of the 107 non-tenured, family owned, member companies of the Independent Wood Processors Association closed their operations (Independent Wood Processors Association 2018).

In 2016, the BC Government published a "B.C. Forest Sector Competitiveness: Value Added Action Plan" but this initiative included neither a new fibre access initiative for wood processors without a long-term tenure nor an overhaul of the BCTS Category 2 program.

Secure access to at least 50% of a wood processing facility's[143] fibre input is critical in the Haida Gwaii context as the fibre basket is effectively limited from a financial standpoint by the geographic isolation of the islands. The Haida Gwaii situation should be viewed as distinct in this regard within the BC context. In the BC Southern Interior, BC Northern Interior and even on Vancouver Island, mills do run up against log cost challenges based on transport distance but their commercially viable fibre baskets are relatively large by comparison to Haida Gwaii mills.

The issue of access on Haida Gwaii however is inextricably bound up with a few other very important challenges as was observed in the background paper for the (Haida Gwaii) Forestry Strategy Forum. Availability of qualified workers (who are cost effective, i.e. are not long distance commuters) is a current and will be a growing consideration given Haida Gwaii's demographic challenges. The lack of an adequate marine terminal creates a big competitiveness cost challenge. But the main challenges are the financial capability of mill operators to access logs within the parameters of the domestic log market and BC

[143] Whether a large, medium or small-scale mill. The secure access could vary by scale of processing facility. For example, a small or micro scale mill may be viable with a long-term salvage arrangement that offers a satisfactory flow of fibre that can be processed or traded.

Government policies and programs for stumpage and market pricing and the directly related challenge of the overall financial viability of manufacturing and marketing wood products from the remote location of Haida Gwaii.

A few respondents in the interviews conducted for this socio-economic project suggested that Haida Gwaii logs should be made available to Haida Gwaii wood processors on what can be termed a cost plus basis rather than using a VLM price as a starting point. This approach would be distinct within the BC Government public lands timber management context as it is not available to communities, First Nations and business enterprises engaged in wood processing on Vancouver Island or elsewhere in the province. If this arrangement was formalized through a BC Government policy or administrative direction and the wood products made from logs sold in this manner were shipped to the US then this type of log sale arrangement could have a legal impact within the lumber trade arrangements between the Canadian and US federal governments.

At a minimum, the log availability issue could be quickly addressed in part by using current (and fairly modest) website capabilities to set up a "virtual log sort yard" for Haida Gwaii. This idea was mentioned in the summary of the Forestry Strategy Forum and has been tried in a few locations in BC. A physical monumental cedar sort is operating on Haida Gwaii and Infinity West had started to set up a physical log sort at Port Clements but subsequently has put the project on hold (pers. comm. D. Froese 2018).

On a longer term basis, consideration ought to be given to developing a Haida Gwaii strategy focused on log supply to local micro mills and small wood processors. The broader Haida Gwaii forestry strategy did not move beyond the 2015 Forestry Forum stage but a strategy making exercise narrowly focused on this one forest sector issue may provide a basis for the various parties engaged and affected by the log supply issue to identify and work out some practices that provide the basis for improved local log supply arrangements and the growing and strengthening of Haida Gwaii micro mills and small sawmills.

5.7 Timber Harvest Needs for Financial Sustainability

A question was posed in this project's RFP about the level of annual average timber harvest in relation to investment security, "What is required (levels of harvest) to provide a security of investment for [harvest] operators?". This question is often discussed throughout the BC forest industry because of the capital and workforce investments that are required to sustain operations over a time period in which investments can be recouped along with a suitable profit in line with the financial risk assumed by the enterprises. In the RFP, the question is focused on market logging operations but the question could also be considered in the context of wood processing operations and stump to dump contractors.[144]

[144] Referred to as truck loggers on coastal BC and also referred to, in many instances, as Section 13 contractors.

In 2017, the BC Government commissioned a "Logging Contractor Sustainability Review", which reported in May 2018 with 13 recommendations to improve the competitiveness of logging contractors. A subsequent facilitation exercise led to a January 2019 announcement that the BC Government will amend the Timber Harvesting Contract and Subcontract Regulation of the *Forest Act* in line with the facilitator's recommendations.[145]

In terms of the level of annual harvest that would be desirable to financially sustain a market logging enterprise on Haida Gwaii, the responses varied between an annual average of 75,000 m^3 and 100,000 m^3. Location of harvesting, specifically terrain conditions, and stand species and age composition, would be important influencers on the amount of desirable operable volume in the Haida Gwaii context but this 75-100,000 m^3 range is a good basis for consideration of the average annual volume that's needed to sustain a viable market logging enterprise over the long term. The lower parameter of this range is similar to TFL 58's AAC of 79,000 m^3, similar to the 80,000 m^3 AAC apportionment for a Haida Gwaii CFA and is likely reflective in general terms of the annual average of the O'Brien & Fuerst market logging operation in the 2000-2015 period on Haida Gwaii.

[145] The recommendations focus on: improving transparency by requiring the parties to jointly develop rate models; improving work predictability and mutual recognition of changed circumstances where rates can be reassessed; establishing a timely and effective arbitration process based on the rate model; and requiring mandatory data collection to improve access to information. See https://news.gov.bc.ca/releases/2019FLNR0010-000056

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8 Appendix I – Forest Sector Economic Impact Estimation Methodology

An estimate of employment and employment income connected to harvesting and processing of Haida Gwaii timber was developed for this report. The estimates of forest industry direct employment are based mainly upon a questionnaire administered to holders of TSA 25 Forest Licences and holders of TFL 58 and 60 tenures and to a questionnaire administered to Haida Gwaii wood processing operations.

Timber harvesting and processing employment is tied to the volume of harvested timber so is calculated as an employment per 1,000 m^3 of harvested timber co-efficient.[146] This approach allows for a ready estimate of forest sector employment and income impacts based on timber harvest level changes. Responses to these questionnaires provide the basis for calculating direct employment per m^3 associated with Haida Gwaii timber harvesting and processing.

Indirect and induced employment impacts were calculated by applying multipliers to the direct employment figures (Horne 2007). Local area multipliers were calculated by BC Stats, based on the BC input/output model, for all areas of the province except the Lower Mainland (Horne 2009a and 2009b). Indirect employment occurs in businesses supplying goods and services to forest sector companies, while induced employment occurs in businesses supported by the spending of direct and indirect employment income. Table 8-1 shows the indirect/induced multipliers for Haida Gwaii.

Table 8-1: Haida Gwaii indirect/induced forest industry multipliers

Industry	Harvesting & Silviculture	Pulp & paper	Other Wood Processing
Multiplier*	1.42	-	1.45

Source: Horne 2009a

Note: * This multiplier incorporates the assumption that employment insurance and other social safety net programs to employed and displaced workers will temporarily encourage them not to leave the community, thereby reducing the induced impacts of a lower harvest level.

Table 8-2 presents province-wide indirect/induced multipliers for the forestry, wood saw milling and pulp and paper processing industries.

[146] Employment is stated in person-years (PYs), which is defined as one person working the equivalent of one full year, which is defined as 180 days of work. A person working for 90 days accounts for 0.5 PYs.

Table 8-2: Province-wide indirect/induced forest industry multipliers

Industry	Harvesting & Silviculture	Pulp & paper	Other Wood Processing
Multiplier	1.99	2.23	1.85

Source: author's calculations based on Horne 2007

The impact estimates presented in the report are intended as indicators of the magnitude of change, rather than as precise estimates. The following qualifications apply:

- In using co-efficients and multipliers to calculate impacts, the employment changes are shown as immediate and in direct proportion to the change in the harvest level. While this is likely accurate for the harvesting sub-sector, it may not be the case for the sawmilling and pulp/paper sub-sectors, which have weaker links to harvest levels and where employment changes are more likely to occur at threshold levels, at which shifts are added or dropped, or mills are closed. Also, indirect and induced impacts would likely occur over a longer period of time, as business and consumer spending levels adjust.

- The co-efficients were derived from a survey of TSA Forest Licensees, and reflect prevailing productivity, harvest practices and forest management for the survey time frame (2015-17). The co-efficients may not reflect future conditions. While there has been a long-term trend of reduced employment co-efficients due to mechanisation and increased labour productivity, increased requirements for planning and more sensitive harvesting methods could result in higher employment co-efficients.

- The employment multipliers are derived from assumptions regarding which sectors are basic to a region which sectors are non-basic; those assumptions may not always be valid. Also, multipliers are based on a static snapshot, and do not reflect the ability of communities to adjust over time to changes in the economic base.

- Economic forecasts are subject to increasing uncertainty, particularly as the time horizon extends beyond a decade.

9 Appendix II – Haida Gwaii Labour Force, 2006 and 2016

Table 9-1: Haida Gwaii Labour Force, 2006

2006	Masset	Queen Charlotte	Port Clements	Electoral Area D	Electoral Area E	Old Massett	Skidegate	Haida Gwaii
Total – Industry (2-digit NAICS code)	545	605	250	440	265	360	365	2,830
11 Agriculture, forestry, fishing and hunting	45	35	55	85	50	40	50	360
21 Mining and oil and gas extraction	0	0	0	0	0	0	0	0
22 Utilities	10	0	0	0	15	0	10	35
23 Construction	20	30	20	25	20	20	40	175
31-33 Manufacturing	55	10	10	20	0	70	0	165
41 Wholesale trade	0	15	0	10	0	0	10	35
44-45 Retail trade	55	75	20	45	10	40	30	275
48-49 Transportation and warehousing	10	25	15	25	30	10	15	130
51 Information and cultural industries	0	0	0	0	0	0	10	10
52 Finance and insurance	10	15	0	0	0	0	10	35
53 Real estate and rental and leasing	0	15	0	10	10	0	0	35
54 Professional, scientific and technical services	30	30	10	10	0	10	0	90
55 Management of companies and enterprises	0	0	0	0	0	10	0	10
56 Administrative and support, waste management and remediation services	10	30	15	25	10	10	15	115
61 Educational services	95	45	15	30	10	20	20	235
62 Health care and social assistance	35	65	30	55	10	20	45	260

	Masset	Queen Charlotte	Port Clements	Electoral Area D	Electoral Area E	Old Massett	Skidegate	Haida Gwaii
71 Arts, entertainment and recreation	35	10	0	25	20	30	20	140
72 Accommodation and food services	50	85	30	35	35	45	15	295
81 Other services (except public administration)	40	30	20	15	5	10	10	130
91 Public administration	45	90	10	25	40	25	65	300

Source: Statistics Canada 2007 and subsequent releases along with author's revisions (eg. aggregating areas to create total Haida Gwaii figures)

Table 9-2: Haida Gwaii Labour Force, 2016

2016	Masset	Queen Charlotte	Port Clements	Electoral Area D	Electoral Area E	Old Massett	Skidegate	Haida Gwaii
Total – Industry (2-digit NAICS code)	415	515	225	240	145	290	460	2,290
11 Agriculture, forestry, fishing and hunting	40	45	75	40	30	30	60	320
21 Mining and oil and gas extraction	0	0	0	0	0	0	0	0
22 Utilities	10	0	0	10	0	0	10	30
23 Construction	35	20	20	25	0	20	25	145
31-33 Manufacturing	20	10	0	0	0	30	10	70
41 Wholesale trade	10	0	0	10	0	10	10	40
44-45 Retail trade	35	65	25	30	10	35	50	250
48-49 Transportation and warehousing	25	30	0	10	35	15	30	145
51 Information and cultural industries	0	10	0	0	0	0	0	10
52 Finance and insurance	0	15	10	10	0	0	10	45

2016	Masset	Queen Charlotte	Port Clements	Electoral Area D	Electoral Area E	Old Massett	Skidegate	Haida Gwaii
53 Real estate and rental and leasing	10	0	0	0	0	0	0	10
54 Professional, scientific and technical services	0	30	0	0	0	0	15	45
55 Management of companies and enterprises	0	0	0	0	0	0	0	0
56 Administrative and support, waste management and remediation services	25	25	10	0	30	10	20	120
61 Educational services	35	55	20	15	10	20	20	175
62 Health care and social assistance	70	90	15	35	10	25	45	290
71 Arts, entertainment and recreation	10	35	0	15	0	25	55	140
72 Accommodation and food services	35	30	30	25	10	30	30	190
81 Other services (except public administration)	10	0	10	0	0	10	30	40
91 Public administration	45	55	10	15	10	30	10	225

Source: Statistics Canada 2017 and subsequent releases along with author's revisions (eg. aggregating areas to create total Haida Gwaii figures)

10 Appendix III – Haida Gwaii TSA and TFL AACs, 2000-2017

Table 10-1: Haida Gwaii TSA and TFL AACs (m^3), 2000 - 2017

Year	TSA 25	TFL 25 (Block 6)	TFL 47 (Moresby Block), now TFL58	TFL 39 (Block 6), Now TFL 60	Haida Gwaii Total
2000	361,000 m^3 (due to Part 13 reduction of 114, 000 m^3, Dec 1999)	115,000 m^3 (from 1998 incorporation of ex-TFL 24)	100,000 m^3 (from Dec 1996 determination)	1,210,000 m^3 (from 1996 determination – not official partition)	1,786,000 m^3
2001				1,150,000 m^3 (contrib in Nov 2001 determination – not an official partition)	1,726,000 m^3
2002					1,726,000 m^3
2003	No change, but 114,000 m^3 Part 13 reduction replaced		100,000 m^3 (re-determined in Aug 200		1,726,000 m^3
2004				1,082,616 m^3 (Oct 2004, due to private land removal – not an official partition)	1,658,616 m^3
2005					1,658,616 m^3

Year	TSA 25	TFL 25 (Block 6)	TFL 47 (Moresby Block), now TFL 58	TFL 39 (Block 6), Now TFL 60	Haida Gwaii Total
2006	245,000 m³ (Part 13 reduction of 116,000 m³)	106,500 m³ (Part 13 reduction of 8,500 m³ Oct 2006)	83,000 m³ (Part 13 reduction of 17,000 m³ Oct 2006; TFL 58 formed Dec '06	789,616 m³ (Part 13 reduction of 293,000 m³ Oct 2006)	1,224,116 m³
2007					1,224,116 m³
2008		106,500 m³ (base level and Part 13 reduction re-affirmed in Feb 2008 determination)			1,224,116 m³
2009	475,000 m³ (Part 13 reductions end Dec 31, 2009)	115,000 m³ (Part 13 reductions end Dec 31, 2009)	100,000 m³ (Part 13 reductions end Dec 31, 2009)	1,082 616 m³ (Part 13 reductions end Dec 31, 2009)	1,772,616 m³
2010	869,748 m³ (115 000 m³ added from TFL 25; 279,748 m³ added from TFL 60, Dec 2010)	TFL 25 Block 6 added to TSA 25	100,000 m³	802,868 m³ (Dec 2010; Jan 2010, TFL 39 Blk 6 deleted, TFL 60 formed)	1,772,616 m³
2011					1 772 616 m³
2012 thru 2017	512,000 m³ ("soft" partition, cedar harvest should not exceed 38%, i.e. 195,000 m³)		79,000 m³ ("soft" partition, cedar harvest should not exceed 41%, i.e. 32,000 m³)	340,000 m³ ("soft" partition, cedar harvest should not exceed 39%, i.e. 133,000 m³)	931,000 m³ ("soft" partition for cedar harvest)

Source: Sutherland 2012

11 Appendix IV – BCTS TSL awards on Haida Gwaii, 2008-2017

Table 11-1 itemizes the TSL awards by BCTS on Haida Gwaii over the 2008-2017 period. The table's data includes the TSL numbers, timber sale bid winners, general location of the TSL areas, TSL volumes, TSL issuance dates and TSL activity status. The codes used in the table to indicate TSL activity status are as follows: HI – pre-worked but harvesting not started or harvesting underway; HX – cancelled; and HC – closed.

Table 11-1: BCTS TSL awards for the Haida Gwaii TSA, 2008-2017

TSL	Licensee	Operating Area	Volume (m^3)	TSL Issued Date	TSL File Status
A83896	Abfam enterprises	New Year Lake	1,645	10/26/2009	HC
A85757	Abfam enterprises	Loon Lake	14,707	2/9/2011	HC
A90732	Abfam enterprises	Loon Lake	34,389	12/3/2013	HC
A85507	Abfam enterprises	Loon lake	15,342	3/30/2010	HC
A93121	O'Brien & Fuerst (Dennis Reindl)	Delkatla	15,427	3/31/2016	HI
A86082	O'Brien & Fuerst (Dennis Reindl)	East Coast	29,832	3/30/2016	HC
A93736	O'Brien & Fuerst (Dennis Reindl)	Naikoon	14,289	3/22/2016	HC
A83752	O'Brien & Fuerst (Dennis Reindl)	Collison Point	18,961	6/16/2010	HC
A83750	O'Brien & Fuerst (Dennis Reindl)	New Year Lake/Kumdis	16,925	6/9/2010	HC
A83751	O'Brien & Fuerst (Dennis Reindl)	New Year lake	19,667	6/21/2010	HC
A83862	O'Brien & Fuerst (Gloria O'Brien)	Mosquito lake	10,603	4/27/2009	HX
A88589	O'Brien & Fuerst (Gloria O'Brien)	Rennell Sound	20,487	3/26/2012	HC
A68395	O'Brien & Fuerst (Gloria O'Brien)	Rennell Sound	16,397	3/31/2015	HC
A91146	O'Brien & Fuerst (Gloria O'Brien)	Masset Inlet	24,904	3/31/2015	HC
A83859	O'Brien & Fuerst (Gloria O'Brien)	Masset Inlet	24,454	4/15/2009	HC
A90716	O'Brien & Fuerst (Randy O'Brien)	Rennell Sound	18,767	3/28/2013	HC
A88156	O'Brien & Fuerst (Randy O'Brien)	Rennell Sound	37,488	7/6/2011	HC
A85304	O'Brien & Fuerst (Randy O'Brien)	East Coast	89,611	6/28/2012	HC
A90553	O'Brien & Fuerst (Travis O'Brien)	Tlell River	34,620	11/13/2012	HC

TSL	Licensee	Operating Area	Volume (m^3)	TSL Issued Date	TSL File Status
A83253	O'Brien & Fuerst (Travis O'Brien)	New Year	26,347	12/1/2008	HC
A83757	O'Brien & Fuerst (Travis O'Brien)	Loon Lake	26,597	3/26/2012	HC
A85374	O'Brien & Fuerst (Travis O'Brien)	Lawn Hill North	25,301	12/19/2017	HI
A93566	O'Brien & Fuerst (Travis O'Brien)	Skidegate Lake	49,584	1/26/2017	HI
A85561	O'Brien & Fuerst (Travis O'Brien)	Loon Lake	27,459	12/30/2014	HC
A82245	O'Brien & Fuerst (Travis O'Brien)	Lawn Hill	48,959	3/31/2014	HC
A91147	O'Brien & Fuerst (Travis O'Brien)	Rennell Sound	25,759	3/31/2015	HX
A85504	Cam Gamble	East Coast	22,094	11/1/2011	HC
A68535	I. Crosby	Rennell Sound	24,304	12/8/2010	HC
A83559	Taan Forest Ltd.	Skidegate Lake	25,817	12/6/2011	HC
A88784	Husby Forest Products	Collison Point	17,374	3/8/2016	LC
A88783	Husby Forest Products	Collison Point	21,921	12/31/2013	HC
A93738	Inifinity West (Alfred Loewen)	Nadu	29,901	12/11/2017	HI
A93737	Inifinity West (Alfred Loewen)	Hangover Creek	26,356	1/24/2017	HI
A93735	Inifinity West (Alfred Loewen)	Naikoon	18,933	3/9/2016	HC
A83756	Inifinity West (Alfred Loewen)	Lawn Hill North	108,890	10/31/2011	HC
A92922	Infinity West	Drizzle Lake	15,209	9/21/2015	HC
A90971	Infinity West	Delkatla	18,079	10/7/2013	HC
A85508	Infinity West	Loon Lake	22,623	6/30/2010	HC
A93120	Cromwell Projects (Forestry) Ltd	Naikoon	75,383	9/29/2016	HC
A91148	Cromwell Projects (Forestry) Ltd	Naikoon	61,097	11/4/2014	HC
A90975	Cromwell Projects (Forestry) Ltd	Masset Inlet	20,156	3/27/2014	HC
A92174	Delta Cedar Services Ltd	East Coast	23,687	12/10/2015	HC
A85373	Alexander Orest Pawliuk	Jungle	15,152	11/30/2010	HC
A82248	Ashlaur Trading	Mosquito lake	20,018	5/21/2008	HC
A69185	Ashlaur Trading	Masset Inlet	5,822	2/2/2008	HC
A89774	FDH Timber Ltd.	Loon Lake	18,723	9/11/2012	HC
A83864	H&M Forest Products Inc.	Skidegate Lake	28,879	1/13/2012	HC
A83749	Western Forest Products	Loon Lake	7,328	4/30/2008	HC
			1,316,267		

Source: BCTS 2018a